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User Manual

iR-ETN Startup Guide

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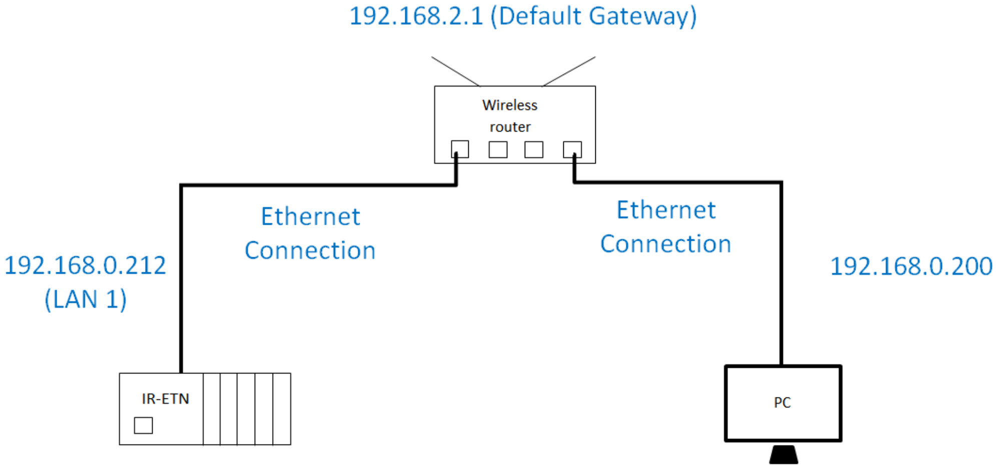
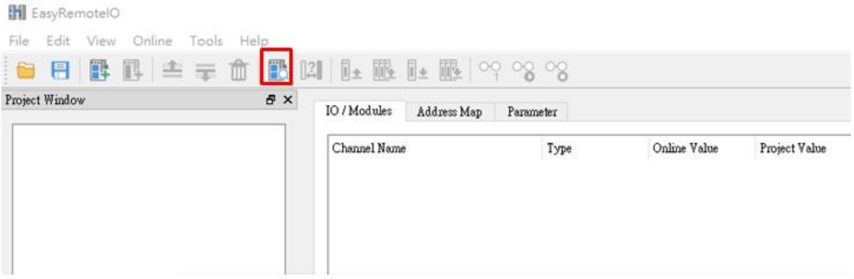
Table of Contents

1. Network Diagram

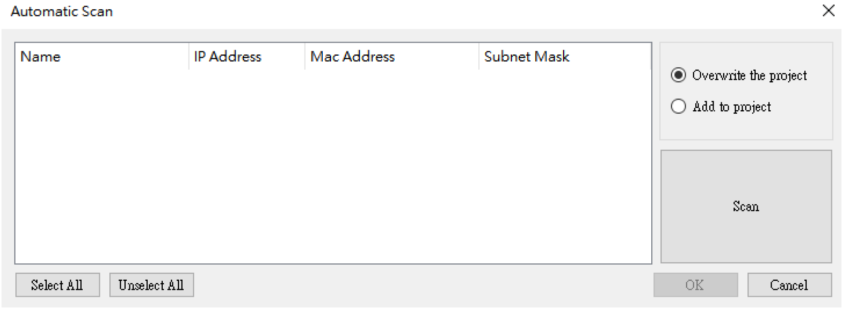
Connect an iR-ETN coupler and a PC to a router with Ethernet cables. The IP address of iR-ETN is set to 192.168.0.212 by default. The EasyRemoteIO utility can be used to change the IP address of the iR-ETN. On the PC, right-click on Ethernet adapter of the PC and select properties. You can set your PC to static IP mode from [Internet Protocol Version 4 TCP/IP V4] » [General] tab. Select “Use the following IP address” and set up a valid and non-conflicting IP address. This IP address must be configured in the same subnet, such as 192.168.0.200.



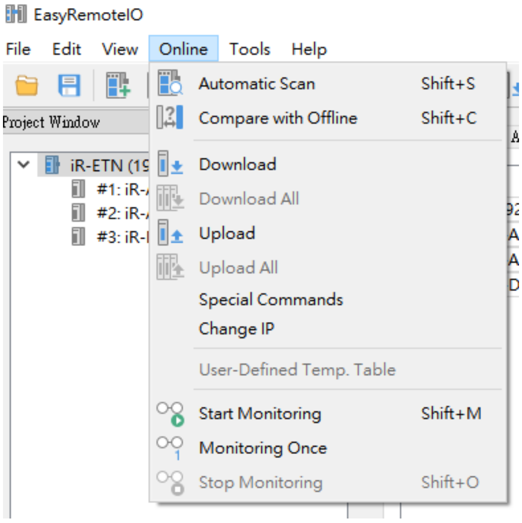
Launch EasyRemote IO. The [Automatic scan] icon can scan all iR-ETN couplers located in this subnet.

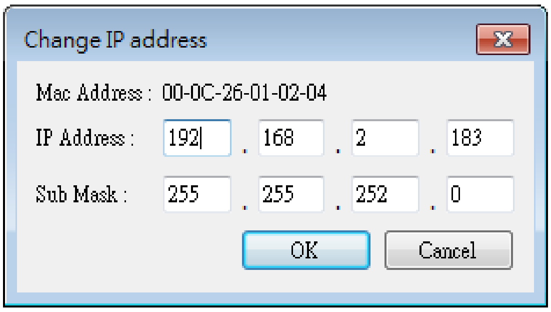


Click on [Scan] button to start. The available couplers will be displayed on this dialog.



Once the iR-ETN is found, go to [Online] » [Change IP]. Enter a new static IP address and a sub mask.



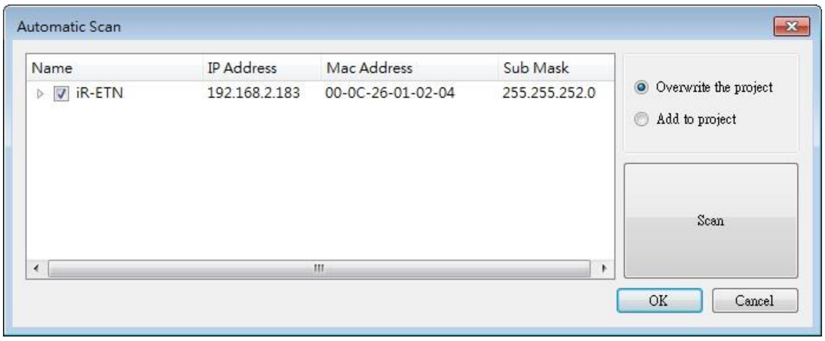


Mac Address : 00-0C-26-01-02-04

IP Address : 192 . 168 . 2 . 183

Sub Mask : 255 . 255 . 252 . 0

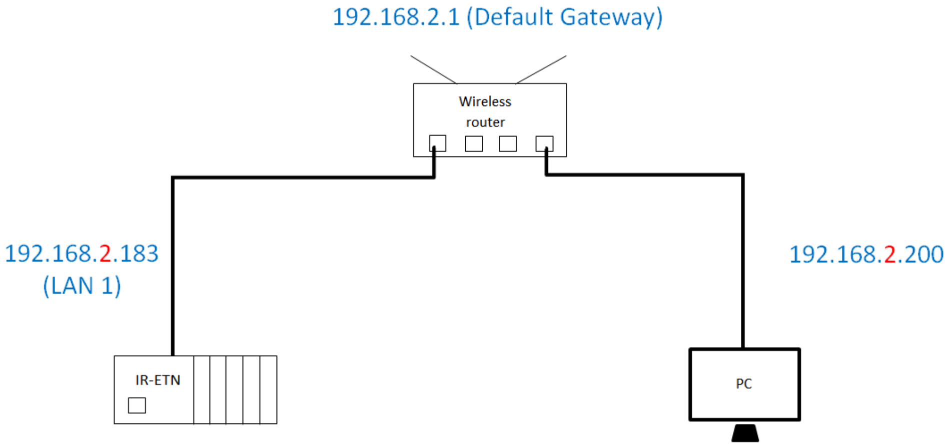
Click [Automatic scan] again, and the iR-ETN will be found with the specified IP address.



Name	IP Address	Mac Address	Sub Mask
☑ iR-ETN	192.168.2.183	00-0C-26-01-02-04	255.255.252.0

● Overwrite the project
○ Add to project

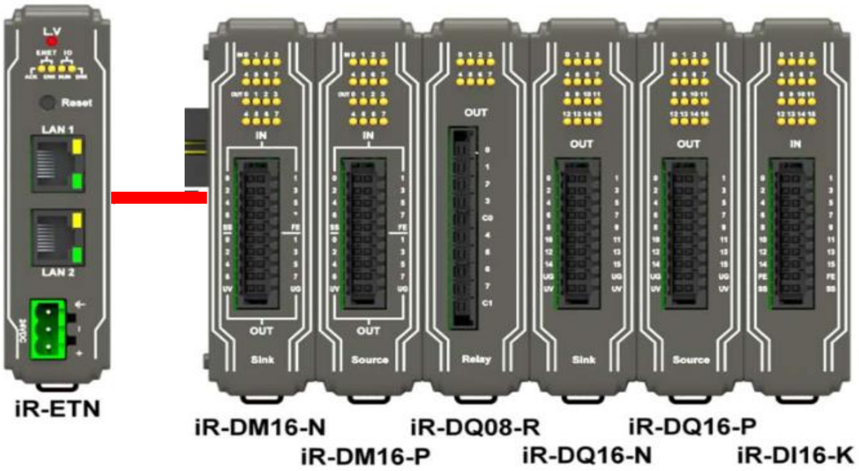
Set the IP address of the PC to DHCP mode. Now all the devices are configured in the same subnet. The current network will be similar to the below diagram.



2. Power Consumption

The iR-ETN coupler supplies power for each connected IO module. To avoid the power requirements exceeding the power supply, you can calculate how much power is required from your IO modules.

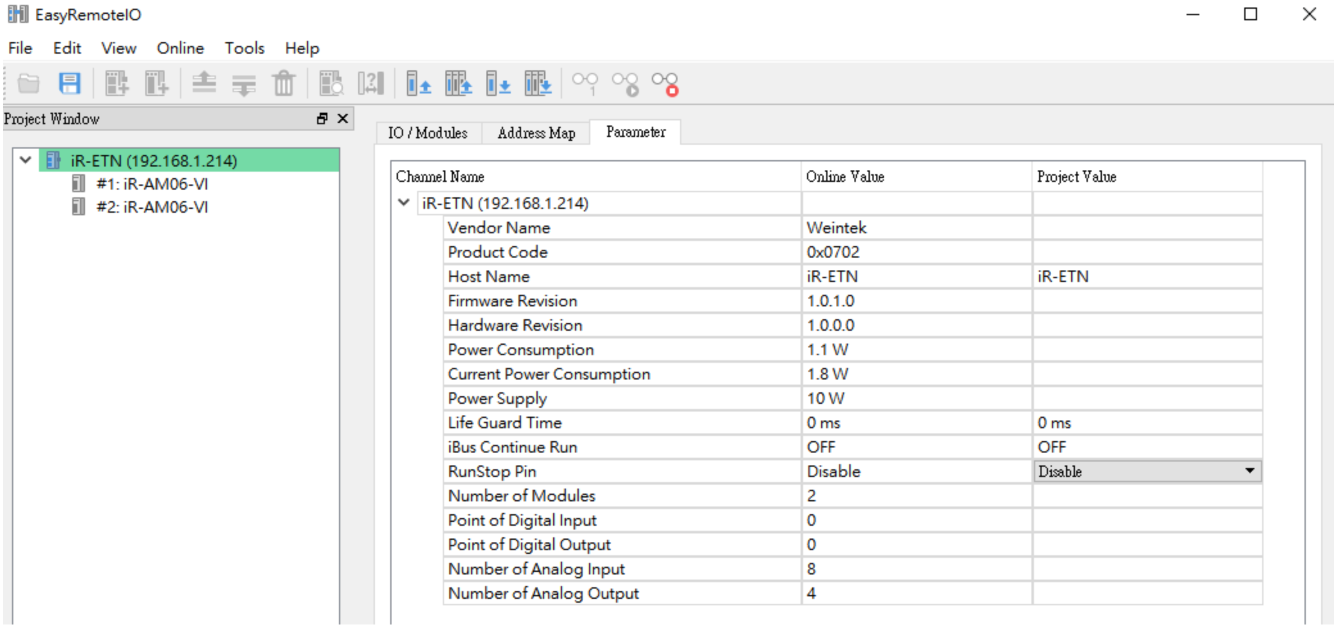
Type	Model Name	Consumption(5V)	Power Supply(5V)
Coupler	iR-ETN	220mA/1.1 W	2A/10w
Digital I/O	iR-DM16-P	130mA/0.65 W	
	iR-DM16-N	130mA/0.65 W	
	iR-DQ08-R	220mA/1.1 W	
	iR-DQ16-N	205mA/1.02 W	
	iR-DQ16-P	196mA/0.984 W	
	iR-DI16-K	83mA/0.418 W	
Analog IO	iR-AQ04-VI	65mA/0.325 W	
	iR-AI04-VI	70mA/0.35 W	
	iR-AM06-VI	70mA/0.35 W	
	iR-AI04-TR	65mA/0.325 W	
Motion	iR-PU01-P	108mA/0.54 W	



220mA **130+130+220+205+196+83 =964**

Power consumption: 220 + 964=1184mA
Power supply: 2000mA
Supply > Consumption
Power is enough to supply all the IO modules.

The power consumption can be known by selecting [iR-ETN] » [Parameter] tab.
[Current Power Consumption]- indicates the power consumed by each module and coupler.
[Power Consumption] - indicates the power consumption of the selected device.

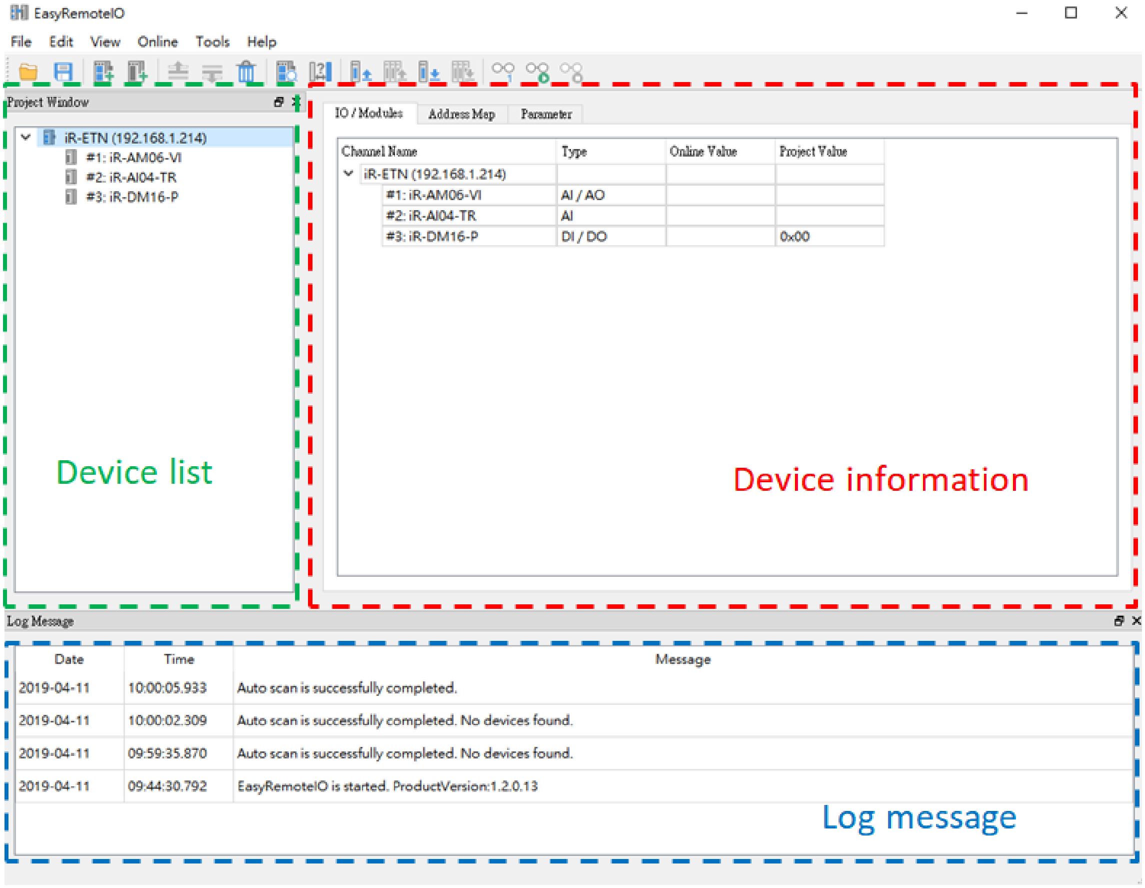


Channel Name	Online Value	Project Value
iR-ETN (192.168.1.214)		
Vendor Name	Weintek	
Product Code	0x0702	
Host Name	iR-ETN	iR-ETN
Firmware Revision	1.0.1.0	
Hardware Revision	1.0.0.0	
Power Consumption	1.1 W	
Current Power Consumption	1.8 W	
Power Supply	10 W	
Life Guard Time	0 ms	0 ms
iBus Continue Run	OFF	OFF
RunStop Pin	Disable	Disable
Number of Modules	2	
Point of Digital Input	0	
Point of Digital Output	0	
Number of Analog Input	8	
Number of Analog Output	4	

If power is not sufficient, an error will be displayed on the Log message window.

3. EasyRemoteIO

EasyRemote I/O is a utility used for setting up iR-ETN coupler and IO module connected to iR-ETN, which includes changing the IP address of the iR-ETN, setting parameters, monitoring IOs, turn on outputs, and changing analog values.



Channel Name	Type	Online Value	Project Value
iR-ETN (192.168.1.214)			
#1: iR-AM06-VI	AI / AO		
#2: iR-AI04-TR	AI		
#3: iR-DM16-P	DI / DO		0x00

Date	Time	Message
2019-04-11	10:00:05.933	Auto scan is successfully completed.
2019-04-11	10:00:02.309	Auto scan is successfully completed. No devices found.
2019-04-11	09:59:35.870	Auto scan is successfully completed. No devices found.
2019-04-11	09:44:30.792	EasyRemoteIO is started. ProductVersion:1.2.0.13

Device list- Lists available iR-ETN couplers. The IO module can be selected under each iR-ETN once connected.

Device information- It includes [IO /modules] tab, [Address] tab, and [Parameter] tab.

[IO /modules] tab- can monitor the status of IOs, toggle bits, and write analog values.

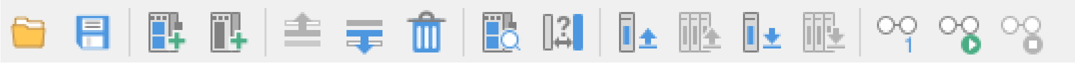
[Address map] tab- displays Modbus mapping table for IOs.

[Parameter] tab- lists the available parameters.

Log message- displays logs and errors.

Note: In this user manual, EasyRemoteIO version 1.2.0.13 is used.

Toolbar overview



(Tools from left to right.)

Tool Name	Descriptions
Open	Opens an old project. (*.eriop file)
Save	Saves this project. (*.eriop file)
Add coupler	Adds a coupler to the Device list.
Add module	Adds a module under the selected coupler.
Move up	Moves up the selected module to adjust slot number.
Move down	Moves down the selected module to adjust slot number.
Delete	Deletes the selected coupler or module.
Scan	Scans all the couplers located in this subnet.
Compare with Offline	Compares this project edited in EasyRemoteIO to the online devices.
Upload	Reads values from a module. The values will be displayed in [IO/ Module] tab » [Online Value] column.
Upload all	Reads values from all the modules.
Download	Writes the value from [Project Value] column to a module.
Download all	Writes all the values from [Project Value] column to all the modules.
Monitor once	Monitors devices once.
Start monitor	Starts monitoring devices
Stop monitor	Stops monitoring devices.

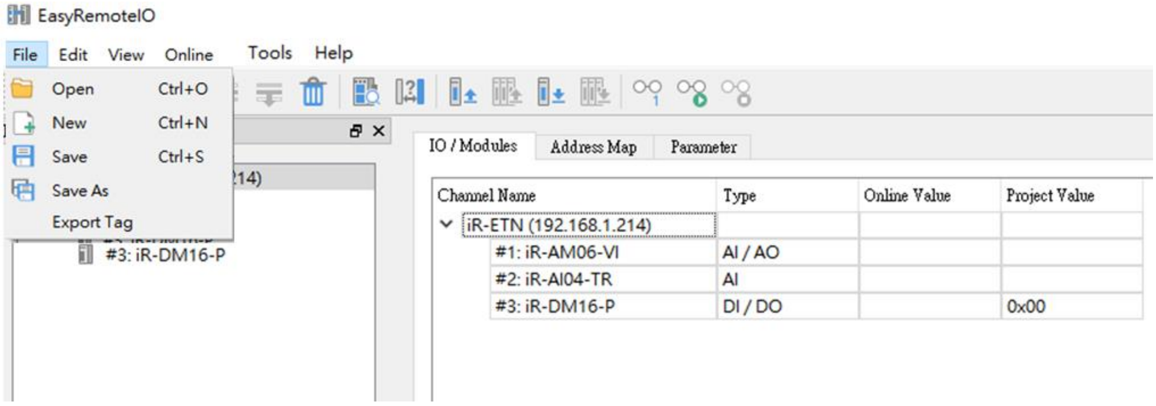
Other tools

Tool Name	Descriptions
Export tag	Exports tags which maps to Modbus address.
Rename	Changes name of the modules or couplers.
Change IP	Changes IP address of couplers.
Special command	Sends special command to a coupler or module.
Modbus	Runs a Modbus TCP/IP master on the PC.
User defined Temp. table	This function will be available if IR-AI04-TR module is used.

Export tag

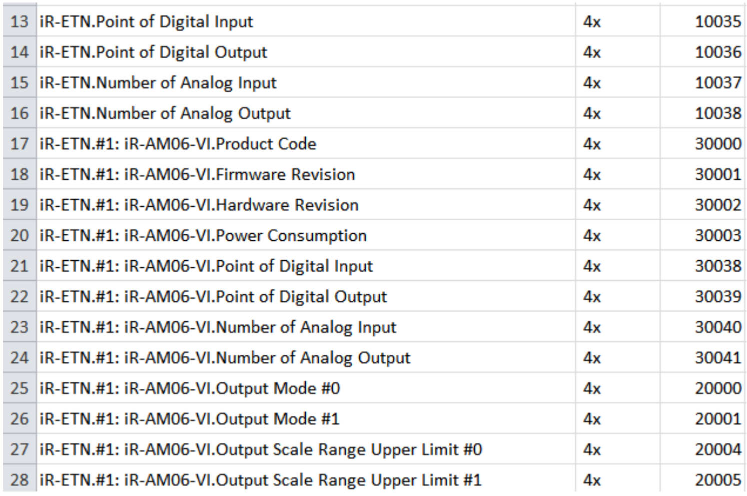
This tool allows you to export tags to .CSV file for reference. This CSV file can be imported to EasyBuilder pro and deploy tags.

In EasyRemoteIO, go to [File] » [Export tag]. Then navigate to a folder you want to save the CSV files. The number of couplers in this project determines the number of CSV files generated by EasyRemoteIO.



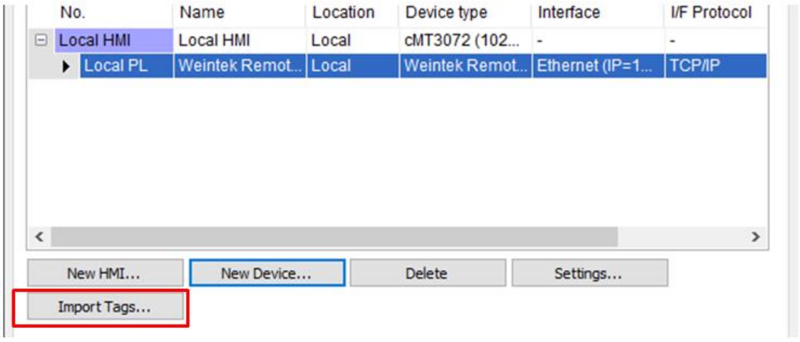
Channel Name	Type	Online Value	Project Value
iR-ETN (192.168.1.214)			
#1: iR-AM06-VI	AI / AO		
#2: iR-AI04-TR	AI		
#3: iR-DM16-P	DI / DO		0x00

The CSV file describes tag name, address type defined by EasyBuilder pro, and Modbus starting address.



13	iR-ETN.Point of Digital Input	4x	10035
14	iR-ETN.Point of Digital Output	4x	10036
15	iR-ETN.Number of Analog Input	4x	10037
16	iR-ETN.Number of Analog Output	4x	10038
17	iR-ETN.#1: iR-AM06-VI.Product Code	4x	30000
18	iR-ETN.#1: iR-AM06-VI.Firmware Revision	4x	30001
19	iR-ETN.#1: iR-AM06-VI.Hardware Revision	4x	30002
20	iR-ETN.#1: iR-AM06-VI.Power Consumption	4x	30003
21	iR-ETN.#1: iR-AM06-VI.Point of Digital Input	4x	30038
22	iR-ETN.#1: iR-AM06-VI.Point of Digital Output	4x	30039
23	iR-ETN.#1: iR-AM06-VI.Number of Analog Input	4x	30040
24	iR-ETN.#1: iR-AM06-VI.Number of Analog Output	4x	30041
25	iR-ETN.#1: iR-AM06-VI.Output Mode #0	4x	20000
26	iR-ETN.#1: iR-AM06-VI.Output Mode #1	4x	20001
27	iR-ETN.#1: iR-AM06-VI.Output Scale Range Upper Limit #0	4x	20004
28	iR-ETN.#1: iR-AM06-VI.Output Scale Range Upper Limit #1	4x	20005

In Easybuilder pro, go to [System Parameters] and add the “Weintek Remote IO(Modbus TCP IP)” driver. Click on [Import Tags] to import the CSV file.

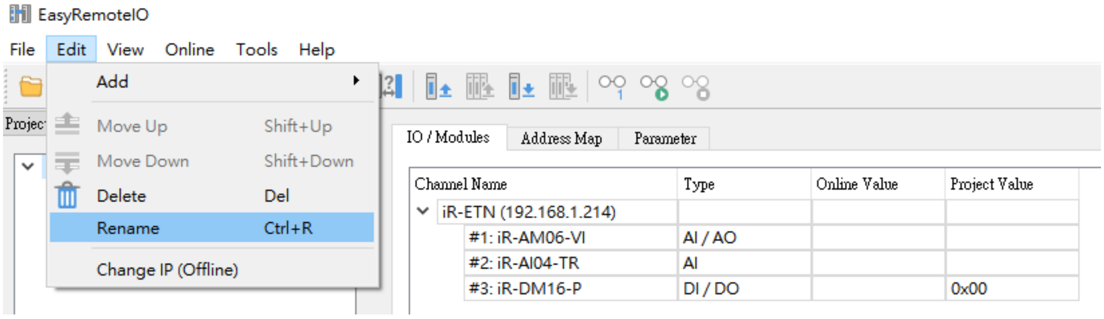


No.	Name	Location	Device type	Interface	I/F Protocol
Local HMI	Local HMI	Local	cMT3072 (102...	-	-
Local PL	Weintek Remot...	Local	Weintek Remot...	Ethernet (IP=1...	TCP/IP

Rename

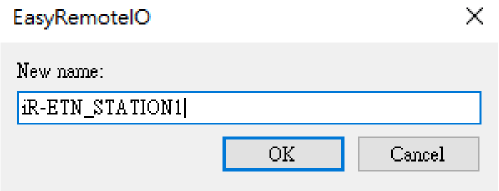
This tool allows you to change the name of modules and couplers for identifying devices.

In EasyRemoteIO, select a module or coupler you want to rename. Go to [Edit] » [Rename].



Channel Name	Type	Online Value	Project Value
iR-ETN (192.168.1.214)			
#1: iR-AM06-VI	AI / AO		
#2: iR-AI04-TR	AI		
#3: iR-DM16-P	DI / DO		0x00

Enter a new name and click OK button.

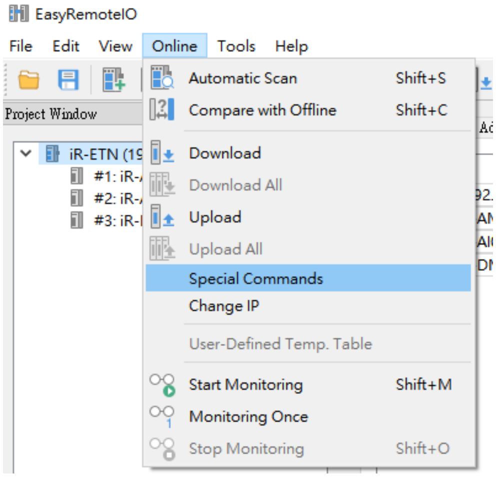


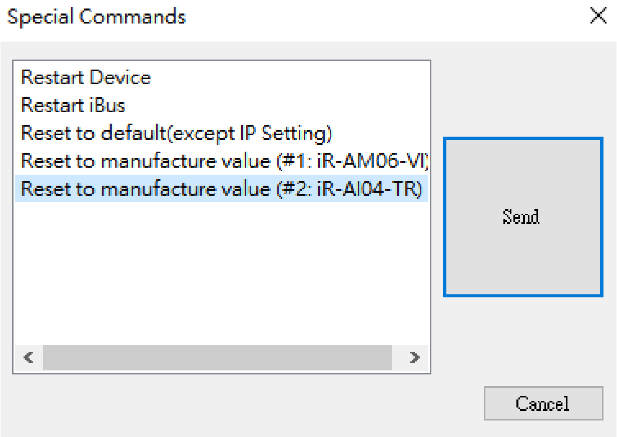
New name: iR-ETN_STATION1

Special command

This tool allows you to send special commands to a coupler or module, such as reset to factory default.

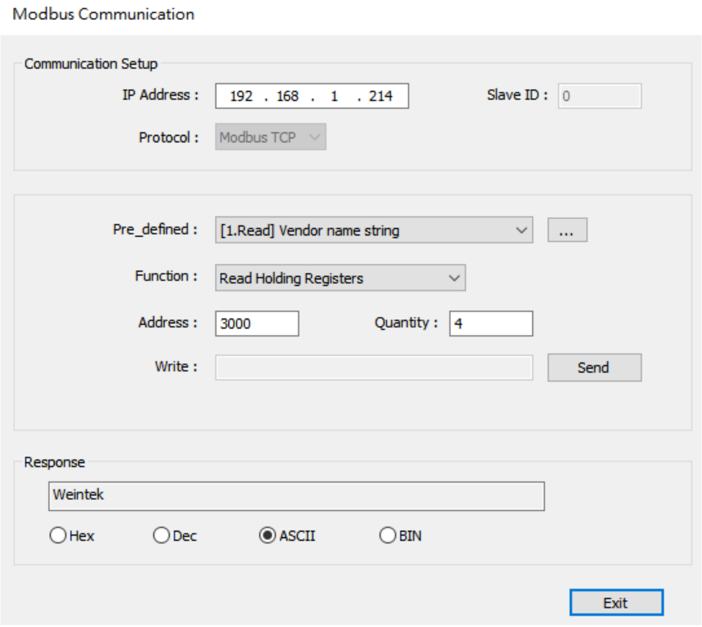
In EasyRemoteIO, go to [Online] » [Special Commands]. The available special command will be displayed. Select a command and click [Start].




Special Commands
Restart Device
Restart iBus
Reset to default(except IP Setting)
Reset to manufacture value (#1: iR-AM06-VI)
Reset to manufacture value (#2: iR-AI04-TR)
Send
Cancel

Modbus

This tool allows you to run a Modbus TCP/IP master on the PC. To use this function, go to [Tools] » [Modbus].



Modbus Communication

Communication Setup

IP Address : 192 . 168 . 1 . 214

Slave ID : 0

Protocol : Modbus TCP

Pre_defined : [1.Read] Vendor name string

Function : Read Holding Registers

Address : 3000

Quantity : 4

Write :

Response

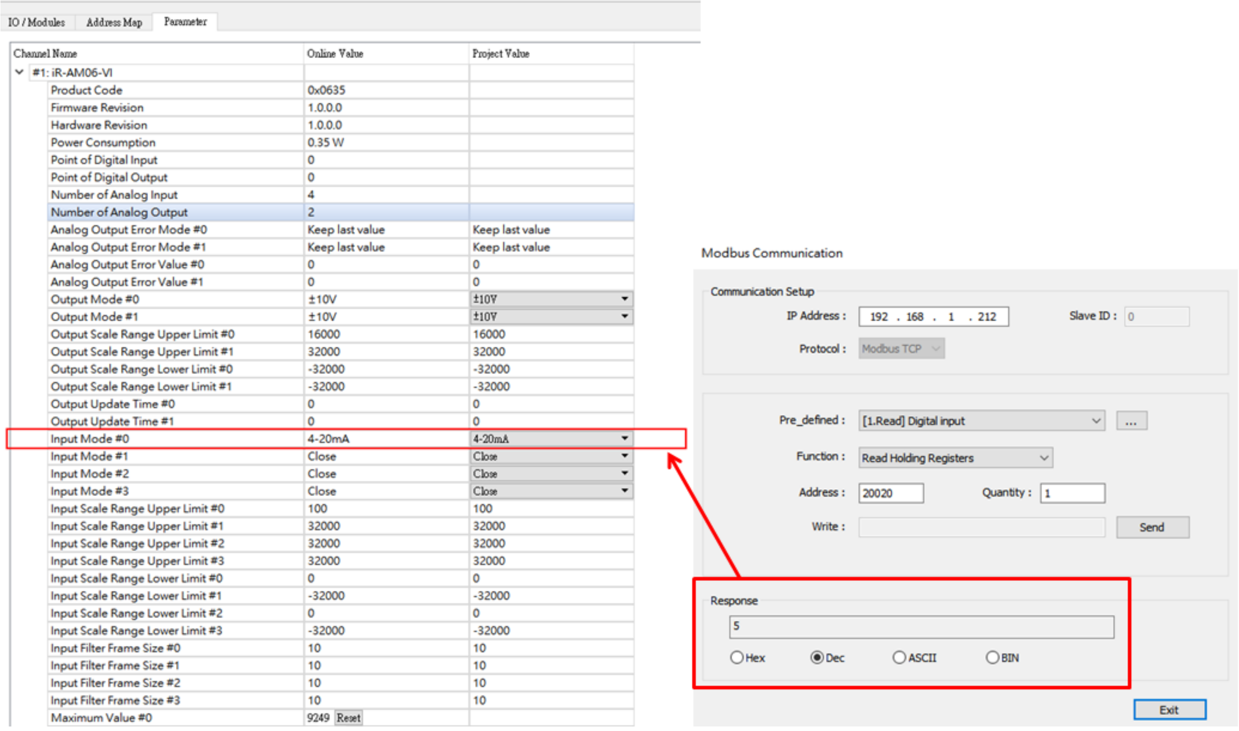
Weintek

○ Hex ○ Dec ● ASCII ○ BIN

[IP Address]- Enter IP address of the coupler you want to access.
[Pre_defined]- You can bring up the tag list. Once a tag is selected, the corresponding function code, address, length will be filled in the boxes.
[Function]- Modbus function code.
[Address]- Modbus starting address.
[Quantity]- Length of the data.

The result will be displayed on [Response] box once clicking on [Send] button. Select a data type to interpret this data.

For example, use this tool to read the parameter "Input Mode #0," which is channel 0 of the analog input.
Function: Read Holding Registers.
Address: 20020
Quantity: 1
Data type: decimal
The constant value five on the Response box indicates 4-20mA signal.



Channel Name	Online Value	Project Value
#1: iR-AM06-VI		
Product Code	0x0635	
Firmware Revision	1.0.0.0	
Hardware Revision	1.0.0.0	
Power Consumption	0.35 W	
Point of Digital Input	0	
Point of Digital Output	0	
Number of Analog Input	4	
Number of Analog Output	2	
Analog Output Error Mode #0	Keep last value	Keep last value
Analog Output Error Mode #1	Keep last value	Keep last value
Analog Output Error Value #0	0	0
Analog Output Error Value #1	0	0
Output Mode #0	±10V	±10V
Output Mode #1	±10V	±10V
Output Scale Range Upper Limit #0	16000	16000
Output Scale Range Upper Limit #1	32000	32000
Output Scale Range Lower Limit #0	-32000	-32000
Output Scale Range Lower Limit #1	-32000	-32000
Output Update Time #0	0	0
Output Update Time #1	0	0
Input Mode #0	4-20mA	4-20mA
Input Mode #1	Close	Close
Input Mode #2	Close	Close
Input Mode #3	Close	Close
Input Scale Range Upper Limit #0	100	100
Input Scale Range Upper Limit #1	32000	32000
Input Scale Range Upper Limit #2	32000	32000
Input Scale Range Upper Limit #3	32000	32000
Input Scale Range Lower Limit #0	0	0
Input Scale Range Lower Limit #1	-32000	-32000
Input Scale Range Lower Limit #2	0	0
Input Scale Range Lower Limit #3	-32000	-32000
Input Filter Frame Size #0	10	10
Input Filter Frame Size #1	10	10
Input Filter Frame Size #2	10	10
Input Filter Frame Size #3	10	10
Maximum Value #0	9249 Reset	

Modbus Communication

Communication Setup

IP Address : 192 . 168 . 1 . 212

Slave ID : 0

Protocol : Modbus TCP

Pre_defined : [1.Read] Digital input

Function : Read Holding Registers

Address : 20020

Quantity : 1

Write :

Response

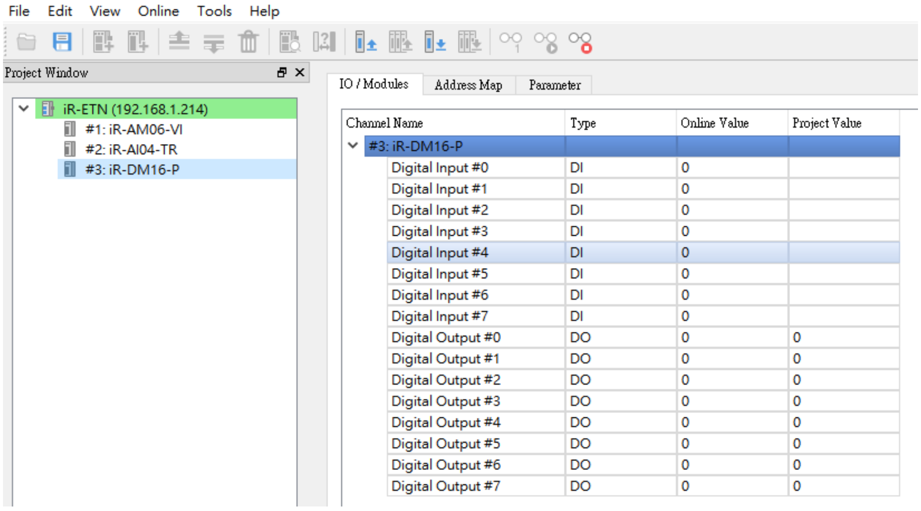
5

○ Hex ● Dec ○ ASCII ○ BIN

4. EasyRemoteIO- Controlling IO Module

Digital IO

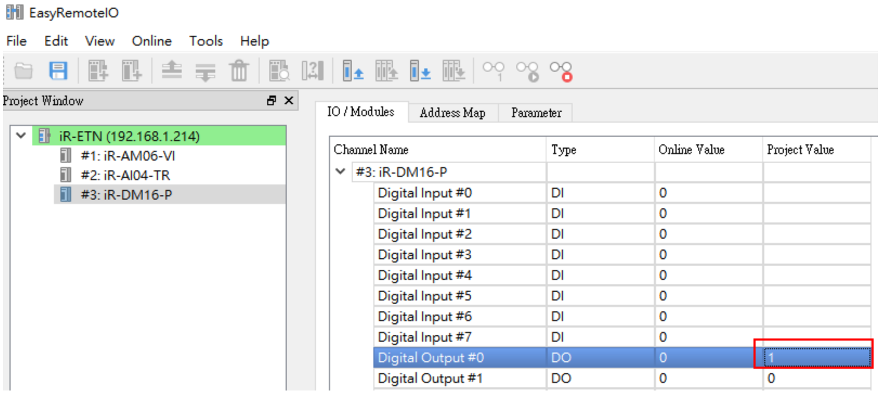
An iR-DM16-P (8 DI and 8 D0) is placed on slot #3. To know status of the digital IO, click on[Online] » [Start Monitoring] and then click on the iR-DM16-P under the iR-ETN coupler. The status of the IO will be listed on [IO / Module] tab.



iR-ETN (192.168.1.214)
- #1: iR-AM06-VI
- #2: iR-AI04-TR
- #3: iR-DM16-P

Channel Name	Type	Online Value	Project Value
#3: iR-DM16-P			
Digital Input #0	DI	0	
Digital Input #1	DI	0	
Digital Input #2	DI	0	
Digital Input #3	DI	0	
Digital Input #4	DI	0	
Digital Input #5	DI	0	
Digital Input #6	DI	0	
Digital Input #7	DI	0	
Digital Output #0	DO	0	0
Digital Output #1	DO	0	0
Digital Output #2	DO	0	0
Digital Output #3	DO	0	0
Digital Output #4	DO	0	0
Digital Output #5	DO	0	0
Digital Output #6	DO	0	0
Digital Output #7	DO	0	0

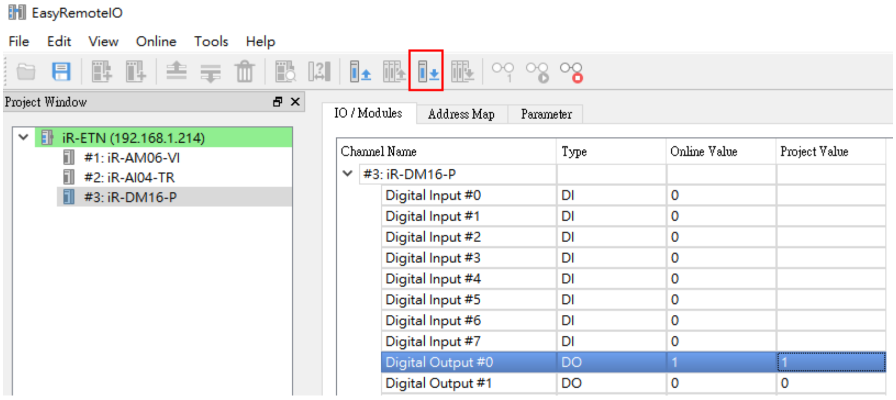
To force the digital output ON, enter 1 to the [Project Value] column.



iR-ETN (192.168.1.214)
- #1: iR-AM06-VI
- #2: iR-AI04-TR
- #3: iR-DM16-P

Channel Name	Type	Online Value	Project Value
#3: iR-DM16-P			
Digital Input #0	DI	0	
Digital Input #1	DI	0	
Digital Input #2	DI	0	
Digital Input #3	DI	0	
Digital Input #4	DI	0	
Digital Input #5	DI	0	
Digital Input #6	DI	0	
Digital Input #7	DI	0	
Digital Output #0	DO	0	1
Digital Output #1	DO	0	0

Click [Download]. Channel 0 of digital output will be turned ON. The [Online Value] column shows the current status of digital IO. (1=ON, 0=OFF)

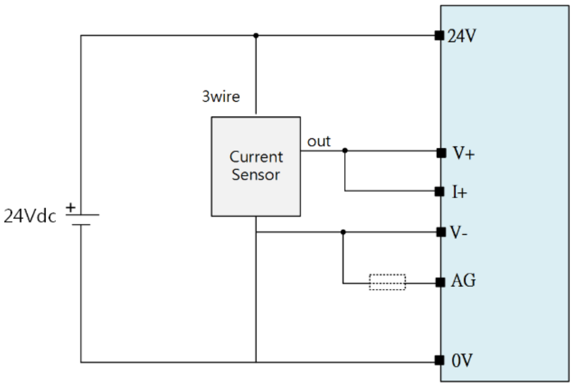


iR-ETN (192.168.1.214)
- #1: iR-AM06-VI
- #2: iR-AI04-TR
- #3: iR-DM16-P

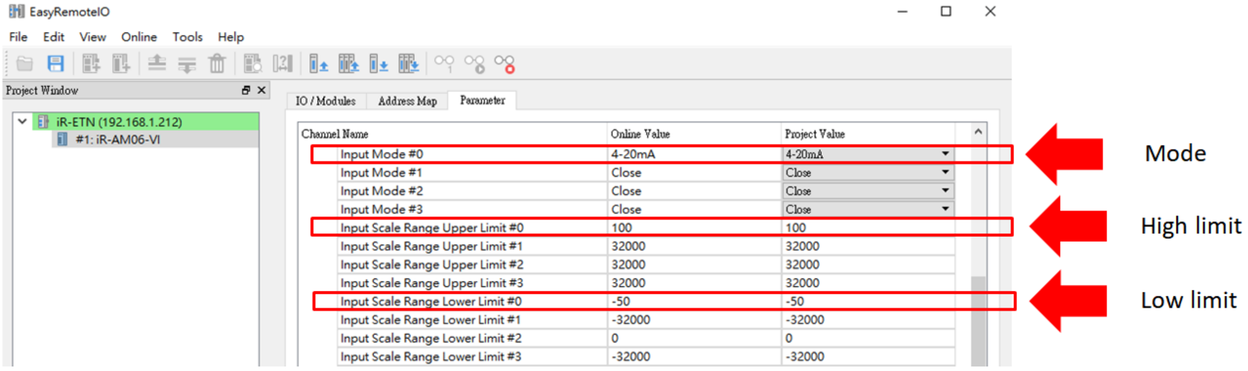
Channel Name	Type	Online Value	Project Value
#3: iR-DM16-P			
Digital Input #0	DI	0	
Digital Input #1	DI	0	
Digital Input #2	DI	0	
Digital Input #3	DI	0	
Digital Input #4	DI	0	
Digital Input #5	DI	0	
Digital Input #6	DI	0	
Digital Input #7	DI	0	
Digital Output #0	DO	1	1
Digital Output #1	DO	0	0

Analog input

In this demonstration, iR-AM06-VI (4 AI and 2 A0) is placed on slot #1. An RTD Pt100 with transmitter (Range:-50-100 ºC, Output:4-20mA) is being connected to the analog input of the module. The wiring diagram is shown below.

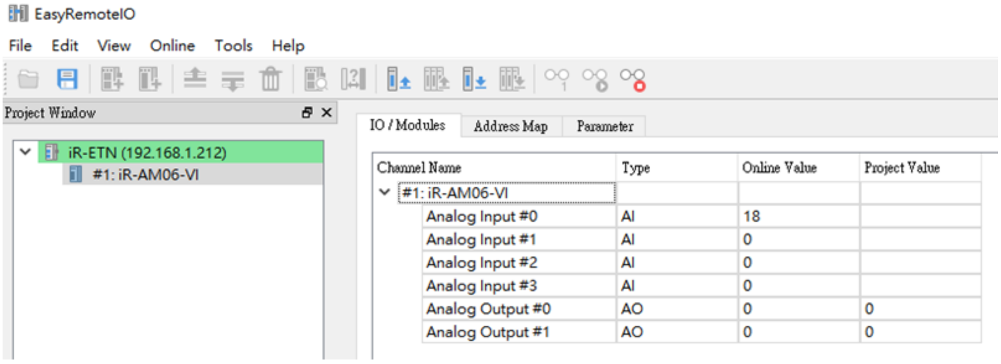


In EasyRemoteIO, go to [Parameter] tab. Configure the **Input mode**, **Upper limit**, and **Lower limit**.
Input Mode #0:4-20mA
Input Scale Range Upper Limit #0: 100
Input Scale Range Upper Limit #0: -50



Channel Name	Online Value	Project Value
Input Mode #0	4-20mA	4-20mA
Input Mode #1	Close	Close
Input Mode #2	Close	Close
Input Mode #3	Close	Close
Input Scale Range Upper Limit #0	100	100
Input Scale Range Upper Limit #1	32000	32000
Input Scale Range Upper Limit #2	32000	32000
Input Scale Range Upper Limit #3	32000	32000
Input Scale Range Lower Limit #0	-50	-50
Input Scale Range Lower Limit #1	-32000	-32000
Input Scale Range Lower Limit #2	0	0
Input Scale Range Lower Limit #3	-32000	-32000

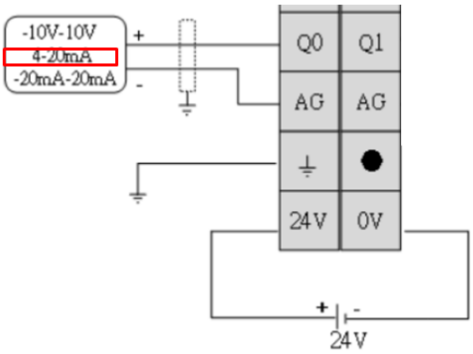
Click [Download]. The settings will be loaded to the module. To monitor the value, click on [Online] » [Start Monitoring] and then go to the [iR-AM06-VI] » [IO / Module] tab.



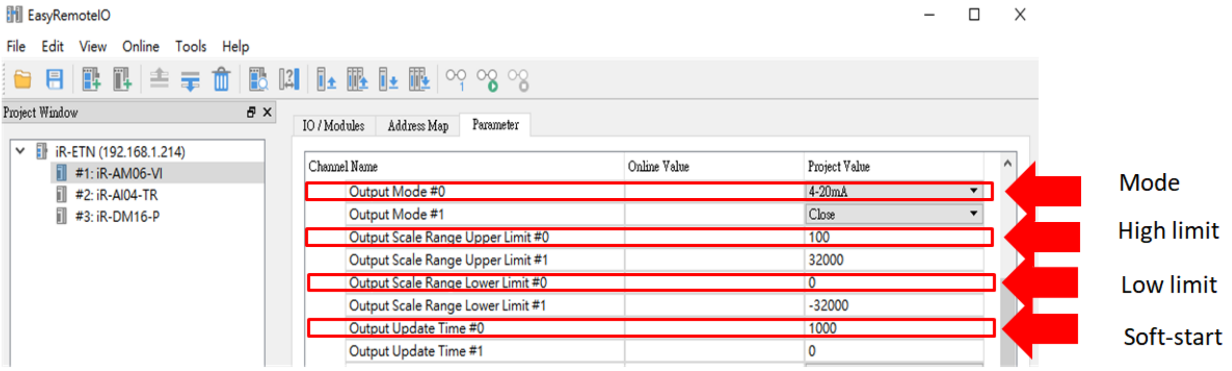
Channel Name	Type	Online Value	Project Value
#1: iR-AM06-VI			
Analog Input #0	AI	18	
Analog Input #1	AI	0	
Analog Input #2	AI	0	
Analog Input #3	AI	0	
Analog Output #0	AO	0	0
Analog Output #1	AO	0	0

Analog output

In this demonstration, iR-AM06-VI (4 AI and 2 A0) is placed on slot #1. A VFD analog input (Input: 4-20mA, Range: 0-60Hz) is being connected to the analog output of the module. The wiring diagram is shown below.



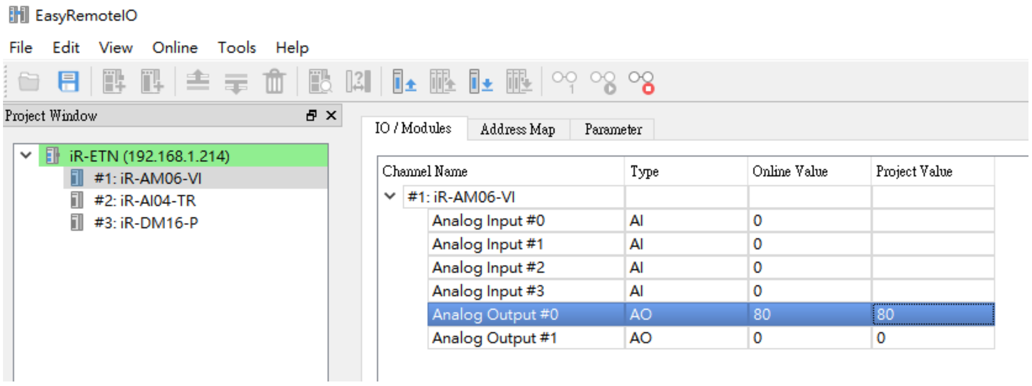
To control the motor speed by sending frequency source, configure the **Output mode**, **Upper limit**, and **Lower limit**, and **Output Update Time** in EasyRemoteIO.
Output Mode #0: 4-20mA
Output Scale Range Upper Limit #0: 100 %
Output Scale Range Upper Limit #0: 0 %
Output Update Time #0: 1000 (10s= 1000*10ms)



Channel Name	Online Value	Project Value
Output Mode #0		4-20mA
Output Mode #1		Close
Output Scale Range Upper Limit #0		100
Output Scale Range Upper Limit #1		32000
Output Scale Range Lower Limit #0		0
Output Scale Range Lower Limit #1		-32000
Output Update Time #0		1000
Output Update Time #1		0

Mode
High limit
Low limit
Soft-start

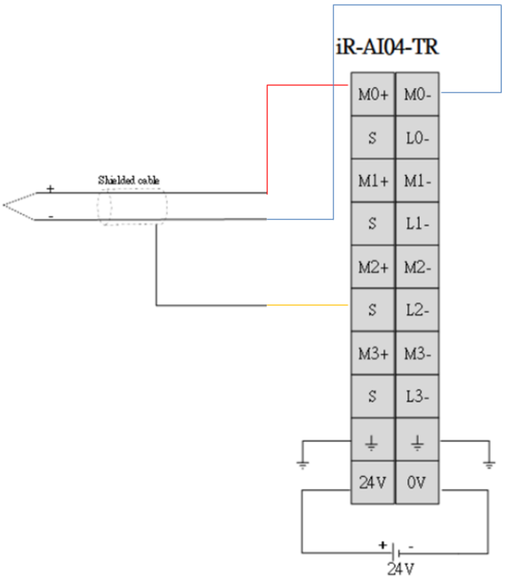
Click [Download]. The settings will be loaded to the module.
To control the motor speed, click on [Online] » [Start Monitoring] and then go to the [iR-AM06-VI] » [IO / Module] tab. Write a constant value to the [Project Value] column. Click [Download] to write the value to the module.



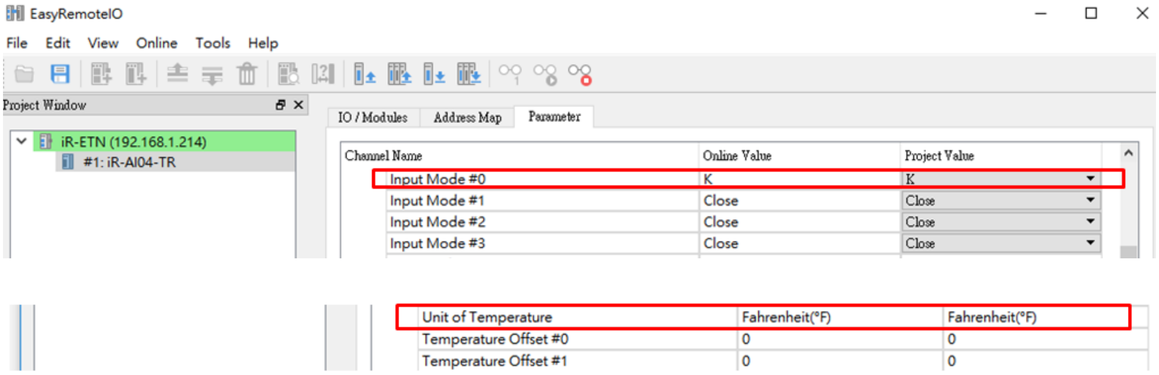
Channel Name	Type	Online Value	Project Value
#1: iR-AM06-VI			
Analog Input #0	AI	0	
Analog Input #1	AI	0	
Analog Input #2	AI	0	
Analog Input #3	AI	0	
Analog Output #0	AO	80	80
Analog Output #1	AO	0	0

Temperature module

In this demonstration, iR-VI04-TR (4 Temperature inputs) is placed on slot #1. A K type thermocouple is being connected to the input of the temperature module. The wiring diagram is shown below.



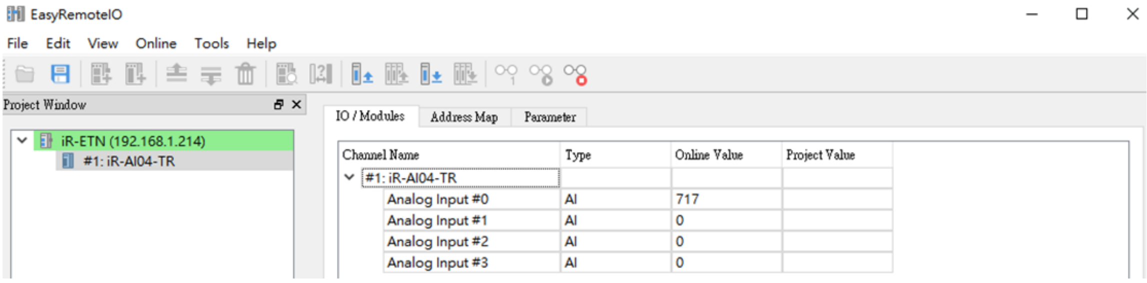
In EasyRemoteIO, go to [Parameter] tab. Select the **input mode** and **unit of temperature**.
Input Mode #0: K
Unit of Temperature: Fahrenheit
Click [Download]. The settings will be loaded to the module.



Channel Name	Online Value	Project Value
Input Mode #0	K	K
Input Mode #1	Close	Close
Input Mode #2	Close	Close
Input Mode #3	Close	Close

Unit of Temperature	Fahrenheit(°F)	Fahrenheit(°F)
Temperature Offset #0	0	0
Temperature Offset #1	0	0

To monitor the temperature, click on [Online] » [Start Monitoring] and then go to the [iR-AI04-TR] » [IO / Module] tab. The raw data is displayed as 717, which is 71.7 °F (one digit after the decimal point).



Channel Name	Type	Online Value	Project Value
#1: iR-AI04-TR			
Analog Input #0	AI	717	
Analog Input #1	AI	0	
Analog Input #2	AI	0	
Analog Input #3	AI	0	

5. iR-ETN IO Module Mapping to Modbus

Digital IO modules

Module name	The number of digital inputs (DI)	The number of digital outputs (DO)
iR-DI16-K	16	0
iR-DM16-P	8	8
iR-DM16-N	8	8
iR-DQ16-P	0	16
iR-DQ16-N	0	16
iR-DQ08-R	0	8 (Relay)

Digital IO modules mapping to Modbus address

Name	Address (HEX)	Address (DEC)	Read/Write	Supported Modbus function code	Descriptions
Digital Input	0x0000-0x0200	0 - 512	R	2	Read in bit
	0x0320-0x035F	800 - 863	R	3, 23	Read in word
Digital Output	0x0000-0x0200	0 - 512	R	1	Read in bit
	0x0000-0x0200	0 - 512	W	5, 15	Write in bit
	0x0360-0x039F	864 - 927	W	6, 16, 23	Write in word

Analog IO modules

Module name	The number of analog inputs (AI)	The number of analog outputs (AO)
iR-AI04-VI	4	4
iR-AM06-VI	4	2
iR-AQ04-VI	0	4
iR-AI04-TR	4 (Temperature)	0

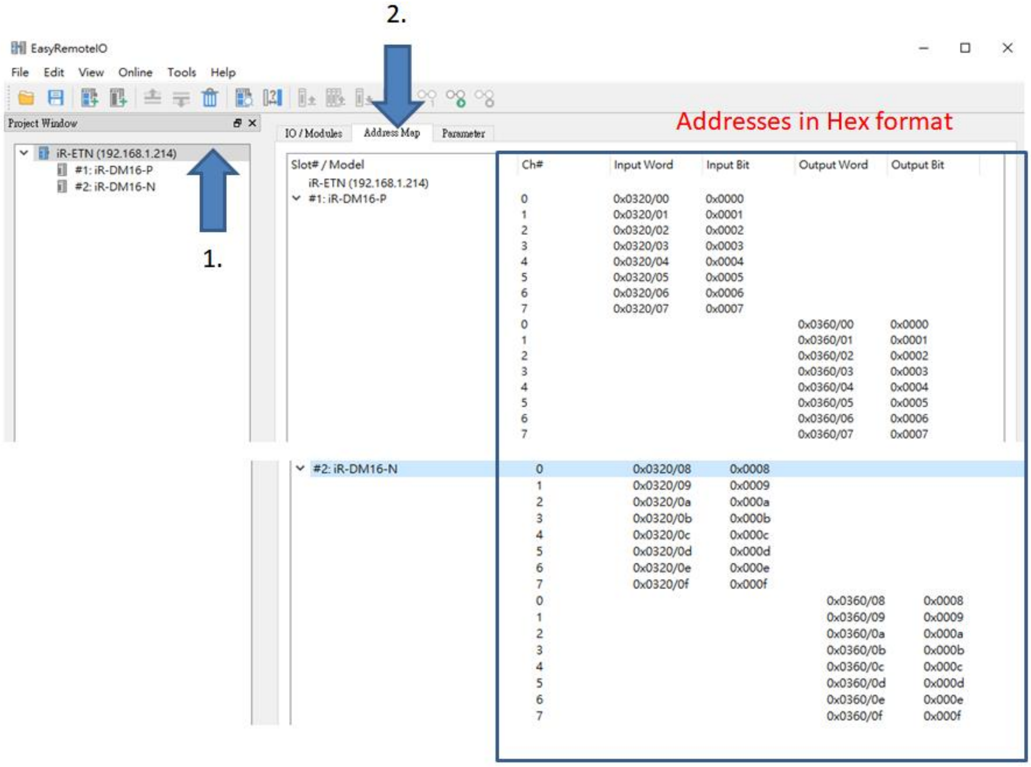
Analog IO modules mapping to Modbus address

Name	Address (HEX)	Address (DEC)	Read/Write	Supported Modbus function code
Analog Input	0x0000-0x00FF	0 - 255	R	3, 4, 23
Analog Output	0x0100- 0x01FF	256 - 511	R	3, 23
			W	6, 16, 23

Example of Digital IO mapping

Slot number	Module name	Bits for input (HEX)	Bits for output (HEX)
# 0	iR-ETN	-----	-----
# 1	iR-DM16-P	0x0000 - 0x0007	0x0000 - 0x0007
# 2	iR-DM16-N	0x0008 - 0x000f	0x0008 - 0x000f

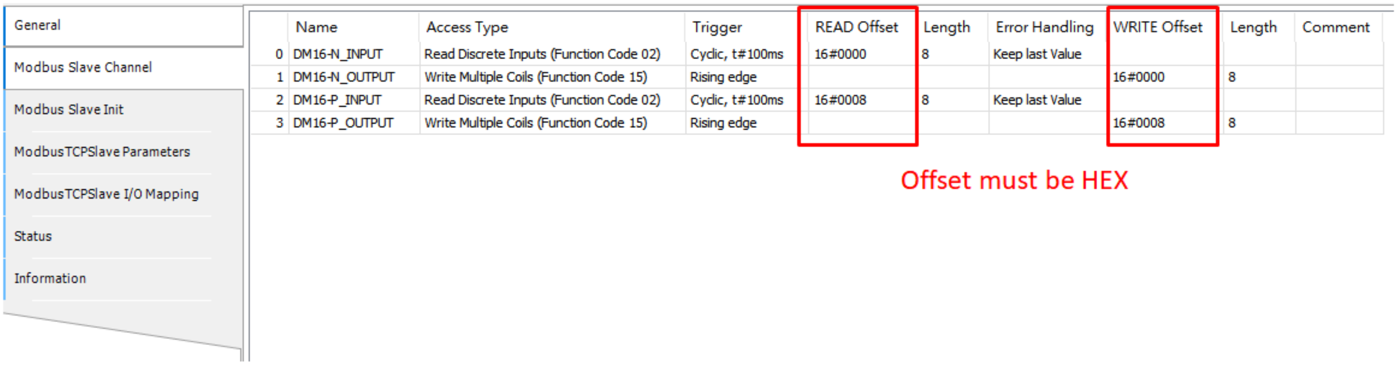
You can know the IO mapping by selecting the iR-ETN coupler and click on [Address Map] tab.



Addresses in Hex format

Slot# / Model	Ch#	Input Word	Input Bit	Output Word	Output Bit
iR-ETN (192.168.1.214)					
#1: iR-DM16-P					
	0	0x0320/00	0x0000		
	1	0x0320/01	0x0001		
	2	0x0320/02	0x0002		
	3	0x0320/03	0x0003		
	4	0x0320/04	0x0004		
	5	0x0320/05	0x0005		
	6	0x0320/06	0x0006		
	7	0x0320/07	0x0007		
	0			0x0360/00	0x0000
	1			0x0360/01	0x0001
	2			0x0360/02	0x0002
	3			0x0360/03	0x0003
	4			0x0360/04	0x0004
	5			0x0360/05	0x0005
	6			0x0360/06	0x0006
	7			0x0360/07	0x0007
#2: iR-DM16-N	0	0x0320/08	0x0008		
	1	0x0320/09	0x0009		
	2	0x0320/0a	0x000a		
	3	0x0320/0b	0x000b		
	4	0x0320/0c	0x000c		
	5	0x0320/0d	0x000d		
	6	0x0320/0e	0x000e		
	7	0x0320/0f	0x000f		
	0			0x0360/08	0x0008
	1			0x0360/09	0x0009
	2			0x0360/0a	0x000a
	3			0x0360/0b	0x000b
	4			0x0360/0c	0x000c
	5			0x0360/0d	0x000d
	6			0x0360/0e	0x000e
	7			0x0360/0f	0x000f

To use Codesys to control IOs, go to [Modbus TCP Slave] » [Modbus Slave Channel] tab. Configure Modbus channels.



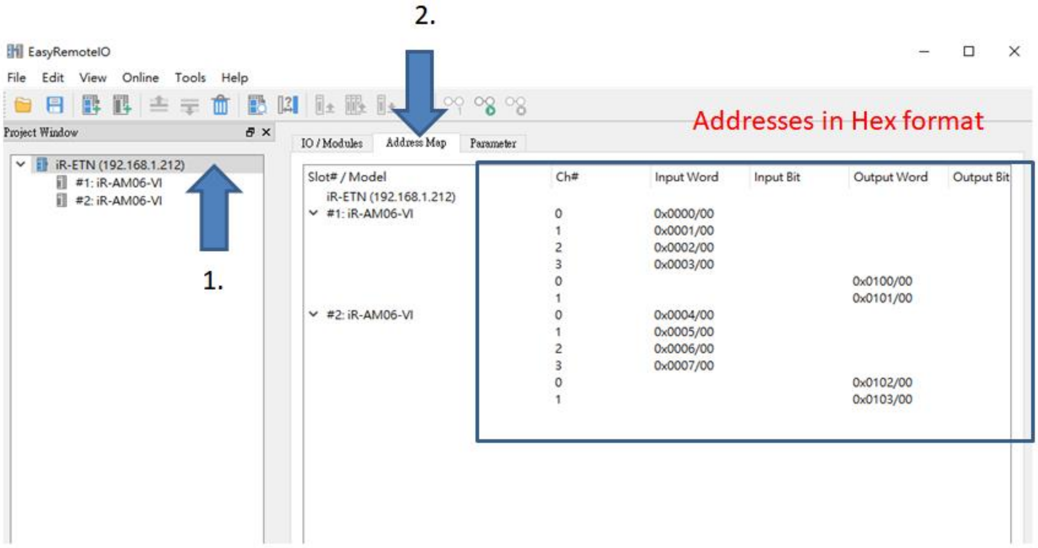
	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	DM16-N_INPUT	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	8	Keep last Value			
1	DM16-N_OUTPUT	Write Multiple Coils (Function Code 15)	Rising edge				16#0000	8	
2	DM16-P_INPUT	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0008	8	Keep last Value			
3	DM16-P_OUTPUT	Write Multiple Coils (Function Code 15)	Rising edge				16#0008	8	

Offset must be HEX

Example of analog IO mapping

Slot number	Module name	Words for input (HEX)	Words for output (HEX)
# 0	iR-ETN	-----	-----
# 1	iR-AM06-VI	0x0000 -0x0003	0x0100 - 0x0101
# 2	iR-AM06-VI	0x0004 -0x0007	0x0102 - 0x0103

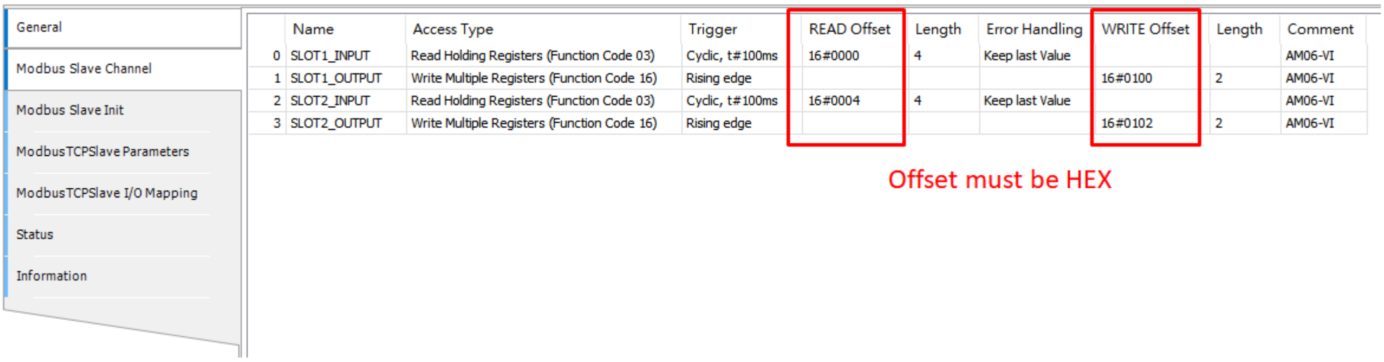
You can know the IO mapping by selecting the iR-ETN coupler and click on [Address Map] tab.



Addresses in Hex format

Slot# / Model	Ch#	Input Word	Input Bit	Output Word	Output Bit
iR-ETN (192.168.1.212)					
#1: iR-AM06-VI	0	0x0000/00			
	1	0x0001/00			
	2	0x0002/00			
	3	0x0003/00			
	0			0x0100/00	
	1			0x0101/00	
#2: iR-AM06-VI	0	0x0004/00			
	1	0x0005/00			
	2	0x0006/00			
	3	0x0007/00			
	0			0x0102/00	
	1			0x0103/00	

To use Codesys to control IOs, go to [Modbus TCP Slave] » [Modbus Slave Channel] tab. Configure Modbus channels.



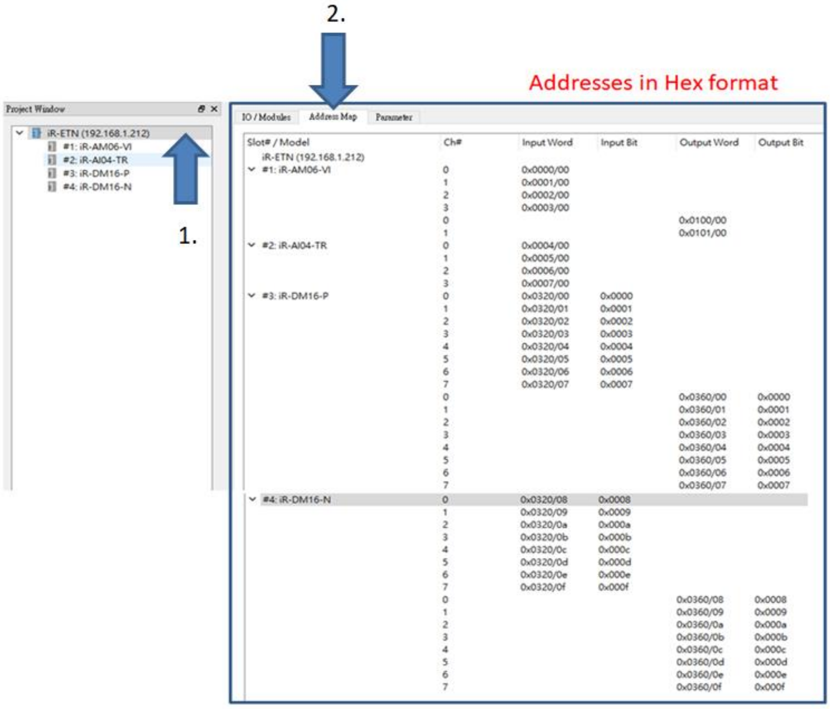
	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	SLOT1_INPUT	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#0000	4	Keep last Value			AM06-VI
1	SLOT1_OUTPUT	Write Multiple Registers (Function Code 16)	Rising edge				16#0100	2	AM06-VI
2	SLOT2_INPUT	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#0004	4	Keep last Value			AM06-VI
3	SLOT2_OUTPUT	Write Multiple Registers (Function Code 16)	Rising edge				16#0102	2	AM06-VI

Offset must be HEX

Example of digital and analog IO mapping

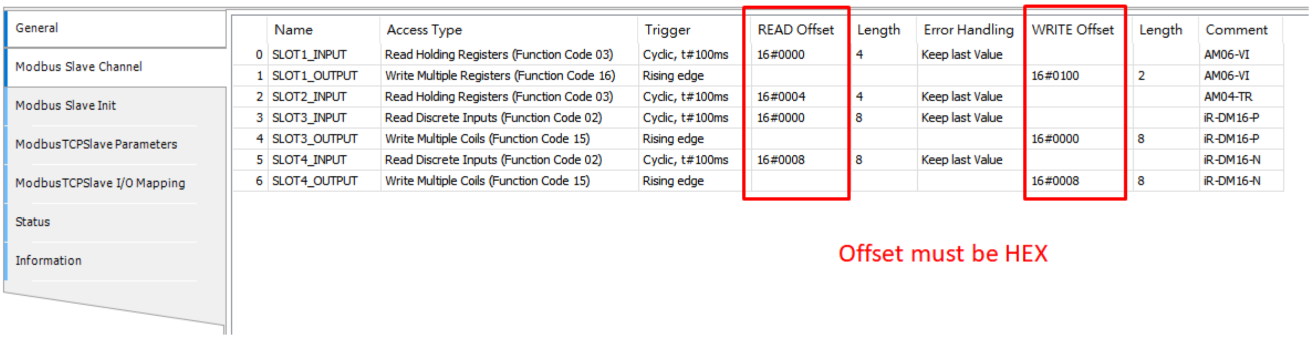
Slot numer	Module name	Words for input (HEX)	Words for output (HEX)
# 0	iR-ETN	-----	-----
# 1	iR-AM06-VI	0x0000 - 0x0003	0x0100 - 0x0101
# 2	iR-AI04-TR	0x0004 – 0x0007	-----
# 3	iR-DM16-P	0x0000 - 0x0007	0x0000 - 0x0007
# 4	iR-DM16-N	0x0008 - 0x000f	0x0008 - 0x000f

You can know the IO mapping by selecting the iR-ETN coupler and click on [Address Map] tab.



Slot# / Model	Ch#	Input Word	Input Bit	Output Word	Output Bit
iR-ETN (192.168.1.212)					
#1: iR-AM06-VI	0	0x0000/00			
	1	0x0001/00			
	2	0x0002/00			
	3	0x0003/00			
	0			0x0100/00	
	1			0x0101/00	
#2: iR-AI04-TR	0	0x0004/00			
	1	0x0005/00			
	2	0x0006/00			
	3	0x0007/00			
#3: iR-DM16-P	0	0x0320/00	0x0000		
	1	0x0320/01	0x0001		
	2	0x0320/02	0x0002		
	3	0x0320/03	0x0003		
	4	0x0320/04	0x0004		
	5	0x0320/05	0x0005		
	6	0x0320/06	0x0006		
	7	0x0320/07	0x0007		
	0			0x0360/00	0x0000
	1			0x0360/01	0x0001
	2			0x0360/02	0x0002
	3			0x0360/03	0x0003
	4			0x0360/04	0x0004
	5			0x0360/05	0x0005
	6			0x0360/06	0x0006
	7			0x0360/07	0x0007
#4: iR-DM16-N	0	0x0320/08	0x0008		
	1	0x0320/09	0x0009		
	2	0x0320/0a	0x000a		
	3	0x0320/0b	0x000b		
	4	0x0320/0c	0x000c		
	5	0x0320/0d	0x000d		
	6	0x0320/0e	0x000e		
	7	0x0320/0f	0x000f		
	0			0x0360/08	0x0008
	1			0x0360/09	0x0009
	2			0x0360/0a	0x000a
	3			0x0360/0b	0x000b
	4			0x0360/0c	0x000c
	5			0x0360/0d	0x000d
	6			0x0360/0e	0x000e
	7			0x0360/0f	0x000f

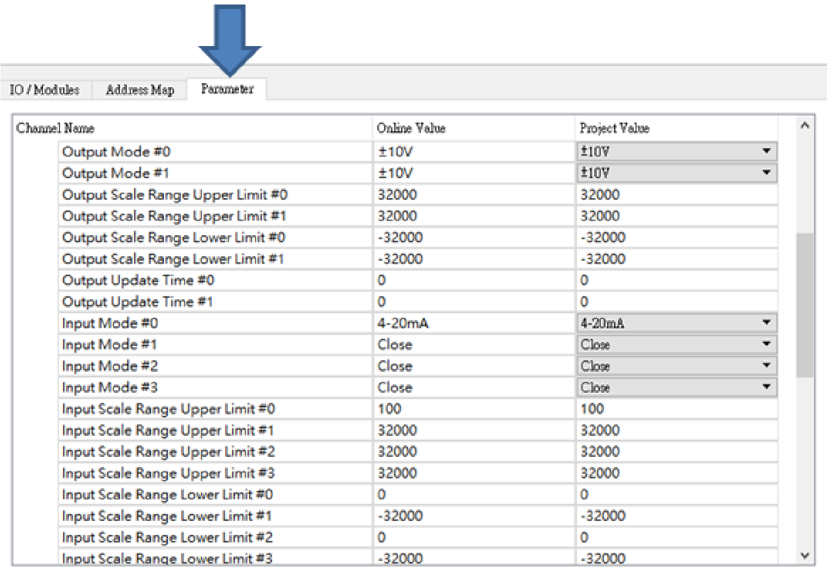
To use Codesys to control IOs, go to [Modbus TCP Slave] » [Modbus Slave Channel] tab. Configure Modbus channels.



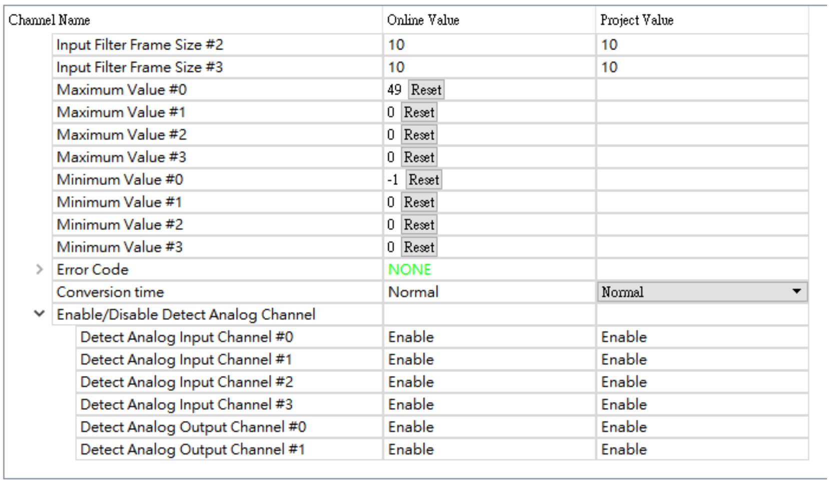
	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	SLOT1_INPUT	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#0000	4	Keep last Value			AM06-VI
1	SLOT1_OUTPUT	Write Multiple Registers (Function Code 16)	Rising edge				16#0100	2	AM06-VI
2	SLOT2_INPUT	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#0004	4	Keep last Value			AM04-TR
3	SLOT3_INPUT	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	8	Keep last Value			iR-DM16-P
4	SLOT3_OUTPUT	Write Multiple Coils (Function Code 15)	Rising edge				16#0000	8	iR-DM16-P
5	SLOT4_INPUT	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0008	8	Keep last Value			iR-DM16-N
6	SLOT4_OUTPUT	Write Multiple Coils (Function Code 15)	Rising edge				16#0008	8	iR-DM16-N

6. Module Register

Each analog module has its module registers (parameters). The parameters may vary based on the analog IO modules you have. The available parameters can be known by selecting [Parameter] tab.



Channel Name	Online Value	Project Value
Output Mode #0	±10V	±10V
Output Mode #1	±10V	±10V
Output Scale Range Upper Limit #0	32000	32000
Output Scale Range Upper Limit #1	32000	32000
Output Scale Range Lower Limit #0	-32000	-32000
Output Scale Range Lower Limit #1	-32000	-32000
Output Update Time #0	0	0
Output Update Time #1	0	0
Input Mode #0	4-20mA	4-20mA
Input Mode #1	Close	Close
Input Mode #2	Close	Close
Input Mode #3	Close	Close
Input Scale Range Upper Limit #0	100	100
Input Scale Range Upper Limit #1	32000	32000
Input Scale Range Upper Limit #2	32000	32000
Input Scale Range Upper Limit #3	32000	32000
Input Scale Range Lower Limit #0	0	0
Input Scale Range Lower Limit #1	-32000	-32000
Input Scale Range Lower Limit #2	0	0
Input Scale Range Lower Limit #3	-32000	-32000



Channel Name	Online Value	Project Value
Input Filter Frame Size #2	10	10
Input Filter Frame Size #3	10	10
Maximum Value #0	49 Reset	
Maximum Value #1	0 Reset	
Maximum Value #2	0 Reset	
Maximum Value #3	0 Reset	
Minimum Value #0	-1 Reset	
Minimum Value #1	0 Reset	
Minimum Value #2	0 Reset	
Minimum Value #3	0 Reset	
Error Code	NONE	
Conversion time	Normal	Normal
Enable/Disable Detect Analog Channel		
Detect Analog Input Channel #0	Enable	Enable
Detect Analog Input Channel #1	Enable	Enable
Detect Analog Input Channel #2	Enable	Enable
Detect Analog Input Channel #3	Enable	Enable
Detect Analog Output Channel #0	Enable	Enable
Detect Analog Output Channel #1	Enable	Enable

To read and write these parameters via Modbus protocol, you need to know their Modbus addresses. The starting register of slot #1 IO module is 20000. The number words of the parameters are 500.

- The starting registers of the following modules are 20000 + (slot number -1) * 500

Mapping table for Module registers

Slot number	Modbus address (DEC)	Modbus address (HEX)
# 0 (iR-ETN)	-----------------	--------------
# 1	20000-20499	4E20-5013
# 2	20500-20999	5014-5207
# 3	21000-21499	5208-53FB
# 4	21500-21999	53FC-55EF
….	…….	……
#16	27500-27999	6B6C-6D5F

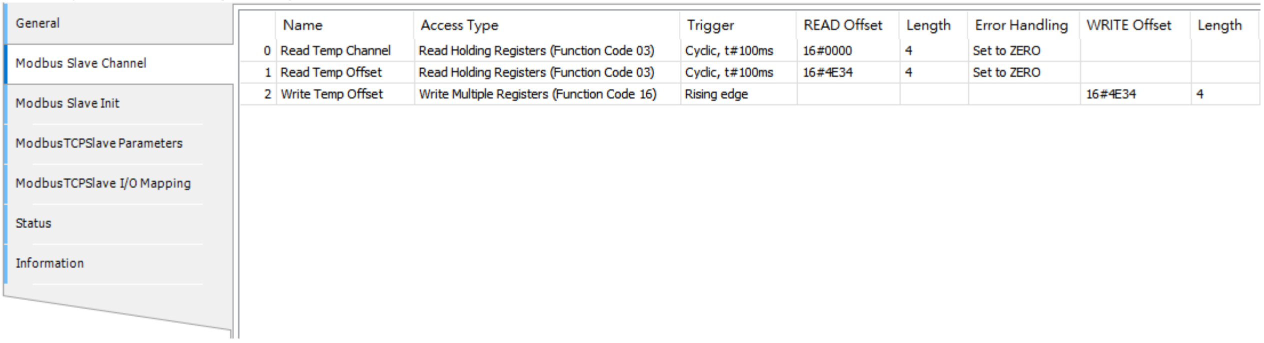
Function code for reading Module registers: 3, 4, 23
Function code for writing Module registers: 6, 16, 23

Module register= (starting register of module) + (register number)
Please refer to **Appendix A** to know the register number for iR-AI04-VI, iR-AM06-VI, iR-AQ04-VI, and iR-AI04-TR.

For example,
The temperature module is placed on slot #1. The starting register is 20000.
To read and write the parameter for **channel 0 temperature offset**, (which is assigned to register number 20) the Modbus register would have to be set to 20020 (=20000+20).

Channel 1 temperature offset is 20021 (=20000+21)
Channel 2 temperature offset is 20022 (=20000+22)
Channel 3 temperature offset is 20023 (=20000+23)

Example of configuring Modbus channels.



	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length
0	Read Temp Channel	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#0000	4	Set to ZERO		
1	Read Temp Offset	Read Holding Registers (Function Code 03)	Cyclic, t#100ms	16#4E34	4	Set to ZERO		
2	Write Temp Offset	Write Multiple Registers (Function Code 16)	Rising edge				16#4E34	4

Ch0 Read Temp Chanel: Reads the values of each temperature channel
Ch1 Read Temp Offset: Reads the offset of each temperature channel
Ch2 Write Temp Offset: Writes the offset of each temperature channel

Example of Module register mapping

Slot number	Module name	The number of DI	The number of DO	The number of AI	The number of AO
# 0	iR-ETN	0	0	0	0
# 1	iR-AQ04-VI	0	0	0	4
# 2	iR-AI04-VI	0	0	4	0
# 3	iR-DQ16-P	8	8	0	0
# 4	iR-AM06-VI	0	0	4	2

Module register of slot #1

Module	Register name	Address (DEC)	Address (HEX)
iR-AQ04-VI	#0 Channel 0 Output Mode	20000	4E20
	#1 Channel 1 Output Mode	20001	4E21
	#2 Channel 2 Output Mode	20002	4E22
	#3 Channel 3 Output Mode	20003	4E23
	………..	……….	……..
	#16 Error Code	20016	4E30
	#17 Command	20017	4E31
	#18 Channel Detection	20018	4E32

Module register of slot #2

Module	Register name	Address (DEC)	Address (HEX)
iR-AI04-VI	#16 Error Code	20516	5024
	#17 Command	20517	5025
	#18 Channel Detection	20518	5026
	#19 Conversion Time	20519	5027
	#20 Channel 0 Input Mode	20520	5028
	#21 Channel 1 Input Mode	20521	5029
	#22 Channel 2 Input Mode	20522	502A
	#23 Channel 3 Input Mode	20523	502B
	………..	……….	………
	#43 Channel 3 Minimum Value	20543	503F

Module register of slot #3

There is no register related to analog input and analog output. Registers 21000-21499 are not used and skipped.

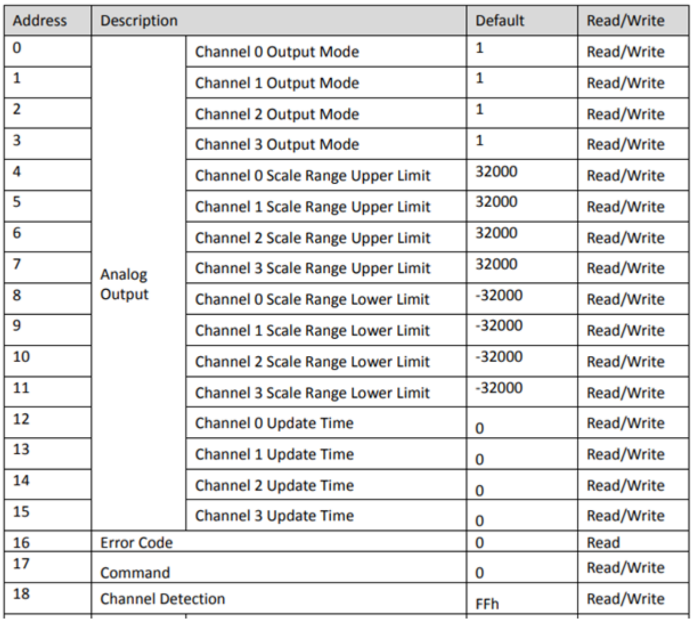
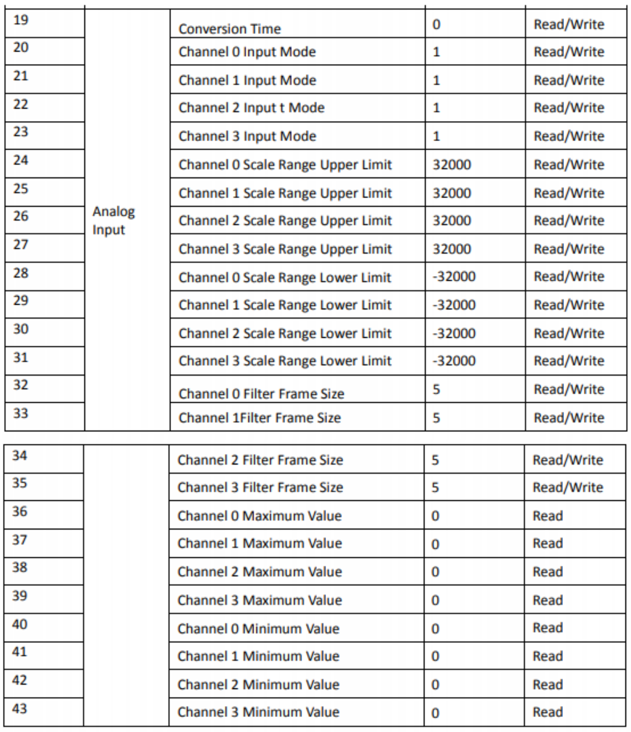
Module	Register name	Address (DEC)	Address (HEX)
iR-DQ16-P	-----------------------		

Module register of slot #4

Module	Register name	Address (DEC)	Address (HEX)
iR-AM06-VI	#0 Channel 0 Output Mode	21500	53FC
	#1 Channel 1 Output Mode	21501	53FD
	#4 Channel 0 Scale Range Upper Limit	21502	53FE
	…………	……….	……..
	#19 Conversion Time	21519	540F
	#20 Channel 0 Input Mode	21520	5410
	#21 Channel 1 Input Mode	21521	5411
	#22 Channel 2 Input Mode	21522	5412
	#23 Channel 3 Input Mode	21523	5413
	…………	……….	……..
	#43 Channel 3 Minimum Value	21543	5427

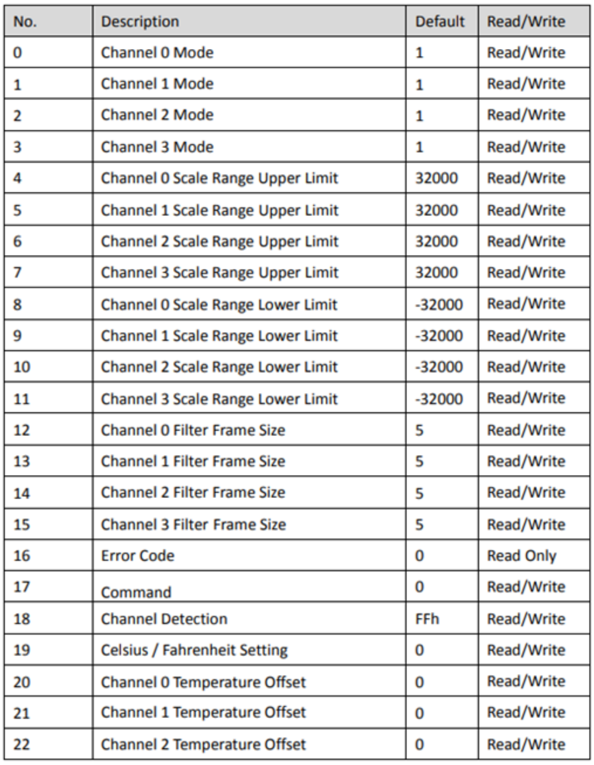
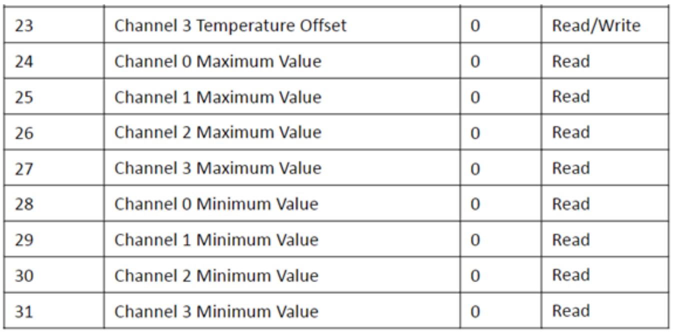
Appendix A- Register Number

Register number for iR-AI04-VI, iR-AM06-VI, and iR-AQ04-VI

Address	Description		Default	Read/Write
0	Analog Output	Channel 0 Output Mode	1	Read/Write
1		Channel 1 Output Mode	1	Read/Write
2		Channel 2 Output Mode	1	Read/Write
3		Channel 3 Output Mode	1	Read/Write
4		Channel 0 Scale Range Upper Limit	32000	Read/Write
5		Channel 1 Scale Range Upper Limit	32000	Read/Write
6		Channel 2 Scale Range Upper Limit	32000	Read/Write
7		Channel 3 Scale Range Upper Limit	32000	Read/Write
8		Channel 0 Scale Range Lower Limit	-32000	Read/Write
9		Channel 1 Scale Range Lower Limit	-32000	Read/Write
10		Channel 2 Scale Range Lower Limit	-32000	Read/Write
11		Channel 3 Scale Range Lower Limit	-32000	Read/Write
12		Channel 0 Update Time	0	Read/Write
13		Channel 1 Update Time	0	Read/Write
14		Channel 2 Update Time	0	Read/Write
15		Channel 3 Update Time	0	Read/Write
16	Error Code		0	Read
17	Command		0	Read/Write
18	Channel Detection		FFh	Read/Write
19	Analog Input	Conversion Time	0	Read/Write
20		Channel 0 Input Mode	1	Read/Write
21		Channel 1 Input Mode	1	Read/Write
22		Channel 2 Input t Mode	1	Read/Write
23		Channel 3 Input Mode	1	Read/Write
24		Channel 0 Scale Range Upper Limit	32000	Read/Write
25		Channel 1 Scale Range Upper Limit	32000	Read/Write
26		Channel 2 Scale Range Upper Limit	32000	Read/Write
27		Channel 3 Scale Range Upper Limit	32000	Read/Write
28		Channel 0 Scale Range Lower Limit	-32000	Read/Write
29		Channel 1 Scale Range Lower Limit	-32000	Read/Write
30		Channel 2 Scale Range Lower Limit	-32000	Read/Write
31		Channel 3 Scale Range Lower Limit	-32000	Read/Write
32		Channel 0 Filter Frame Size	5	Read/Write
33		Channel 1Filter Frame Size	5	Read/Write
34		Channel 2 Filter Frame Size	5	Read/Write
35		Channel 3 Filter Frame Size	5	Read/Write
36		Channel 0 Maximum Value	0	Read
37		Channel 1 Maximum Value	0	Read
38		Channel 2 Maximum Value	0	Read
39		Channel 3 Maximum Value	0	Read
40		Channel 0 Minimum Value	0	Read
41		Channel 1 Minimum Value	0	Read
42		Channel 2 Minimum Value	0	Read
43		Channel 3 Minimum Value	0	Read

Register number for iR-AI04-TR

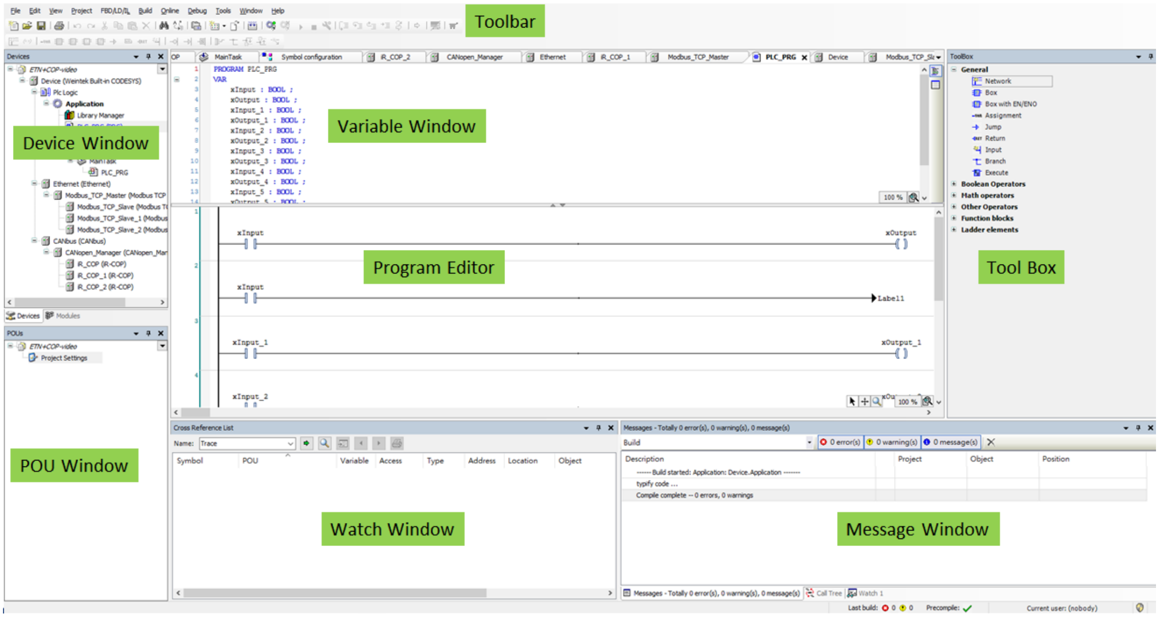
No.	Description	Default	Read/Write
0	Channel 0 Mode	1	Read/Write
1	Channel 1 Mode	1	Read/Write
2	Channel 2 Mode	1	Read/Write
3	Channel 3 Mode	1	Read/Write
4	Channel 0 Scale Range Upper Limit	32000	Read/Write
5	Channel 1 Scale Range Upper Limit	32000	Read/Write
6	Channel 2 Scale Range Upper Limit	32000	Read/Write
7	Channel 3 Scale Range Upper Limit	32000	Read/Write
8	Channel 0 Scale Range Lower Limit	-32000	Read/Write
9	Channel 1 Scale Range Lower Limit	-32000	Read/Write
10	Channel 2 Scale Range Lower Limit	-32000	Read/Write
11	Channel 3 Scale Range Lower Limit	-32000	Read/Write
12	Channel 0 Filter Frame Size	5	Read/Write
13	Channel 1 Filter Frame Size	5	Read/Write
14	Channel 2 Filter Frame Size	5	Read/Write
15	Channel 3 Filter Frame Size	5	Read/Write
16	Error Code	0	Read Only
17	Command	0	Read/Write
18	Channel Detection	FFh	Read/Write
19	Celsius / Fahrenheit Setting	0	Read/Write
20	Channel 0 Temperature Offset	0	Read/Write
21	Channel 1 Temperature Offset	0	Read/Write
22	Channel 2 Temperature Offset	0	Read/Write
23	Channel 3 Temperature Offset	0	Read/Write
24	Channel 0 Maximum Value	0	Read
25	Channel 1 Maximum Value	0	Read
26	Channel 2 Maximum Value	0	Read
27	Channel 3 Maximum Value	0	Read
28	Channel 0 Minimum Value	0	Read
29	Channel 1 Minimum Value	0	Read
30	Channel 2 Minimum Value	0	Read
31	Channel 3 Minimum Value	0	Read

Note:

1. Scale range setting is only available for Voltage mode.
2. Temperature offset setting is only available for Temperature mode.

Appendix B- Connecting iR-ETN to Codesys

Codesys is the world's widely adopted IEC61131-6 standard industrial programming environment. You can choose a Codesys platform from any manufacturer which supports Modbus TCP Master to control remote IO on iR-ETN coupler.

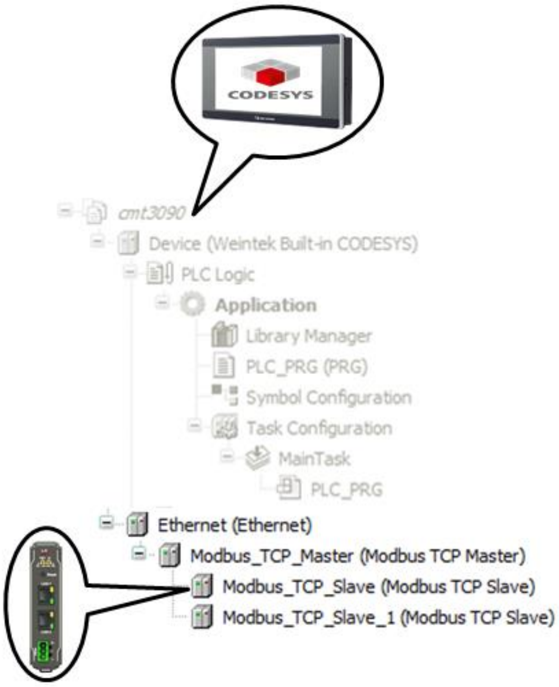


```
PROGRAM PLC_PRG
VAR
    xInput : BOOL ;
    xOutput : BOOL ;
    xInput_1 : BOOL ;
    xOutput_1 : BOOL ;
    xInput_2 : BOOL ;
    xOutput_2 : BOOL ;
    xInput_3 : BOOL ;
    xOutput_3 : BOOL ;
    xInput_4 : BOOL ;
    xOutput_4 : BOOL ;
    xInput_5 : BOOL ;
    xOutput_5 : BOOL ;
```

```
Messages - Totally 0 error(s), 0 warning(s), 0 message(s)
------ Build started: Application: Device.Application -------
typify code ...
Compile complete -- 0 errors, 0 warnings
```

Here we use Codesys v3.5 platform from Weintek to demonstrate how it works. One Codesys soft PLC can control multiple Modbus TCP slaves.

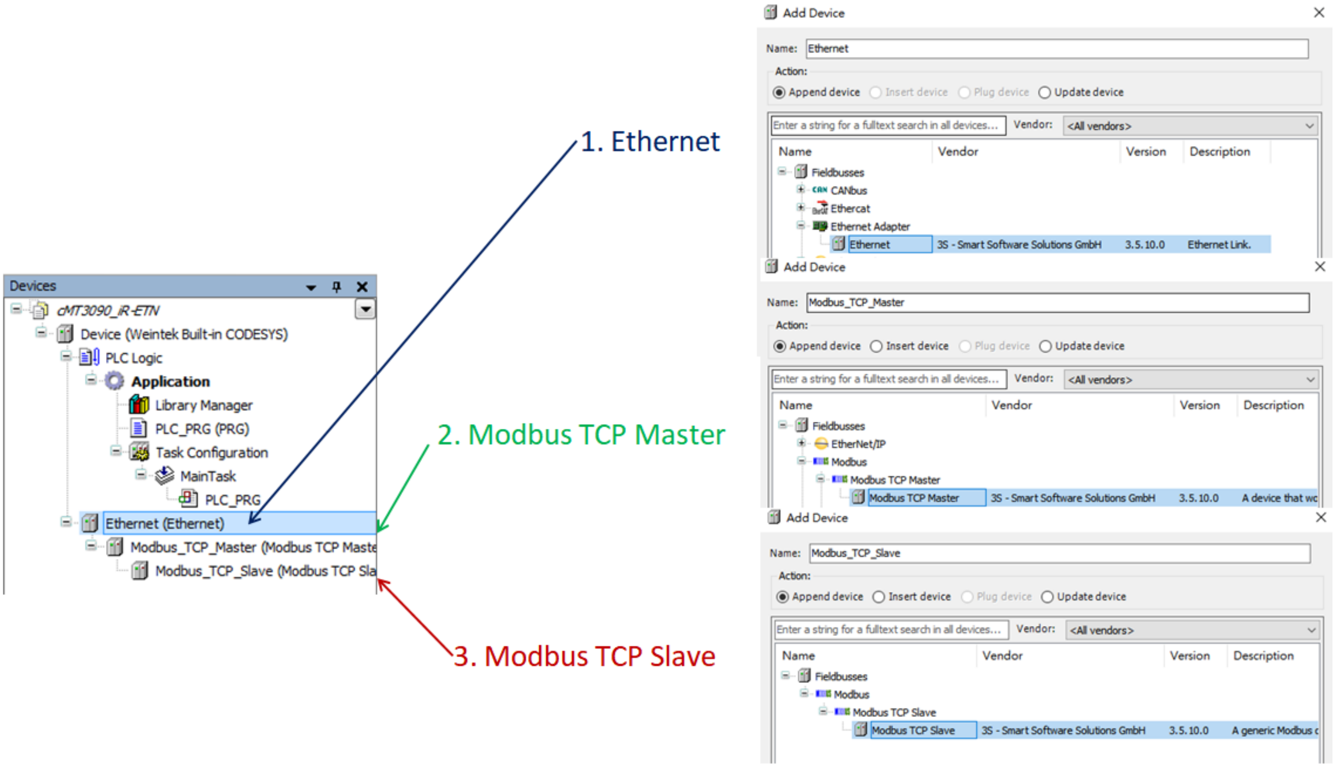
Device window:


CODESYS
cmt3090
Device (Weintek Built-in CODESYS)
PLC Logic
Application
Library Manager
PLC_PRG (PRG)
Symbol Configuration
Task Configuration
MainTask
PLC_PRG
Ethernet (Ethernet)
Modbus_TCP_Master (Modbus TCP Master)
Modbus_TCP_Slave (Modbus TCP Slave)
Modbus_TCP_Slave_1 (Modbus TCP Slave)

Devices are listed hierarchically in Codesys project

- Top level – Fieldbus adapter: Ethernet adapter
- 2nd level – Fieldbus Master (PLC is master)
- 3rd level – Fieldbus Slave (Coupler is slave)

Step1: Right-click [Device] on the Device window and select [Add Device]. Then select [Ethernet Adapter] » [Ethernet]. Click [Add Device] button to add an Ethernet adapter.
Step2: Under the Ethernet adapter, create a Modbus_TCP_Master device. ([Fieldbusses] » [Modbus] » [Modbus TCP Master] » [Modbus TCP Master])
Step3: Under the Modbus_TCP_Master, add a Modbus_TCP_Slave device. (**[**Fieldbusses] » [Modbus] » [Modbus TCP Slave] » [Modbus TCP Slave])



Add Device
Name: Ethernet
Action: ● Append device ○ Insert device ○ Plug device ○ Update device

Name	Vendor	Version	Description
Ethernet	3S - Smart Software Solutions GmbH	3.5.10.0	Ethernet Link.

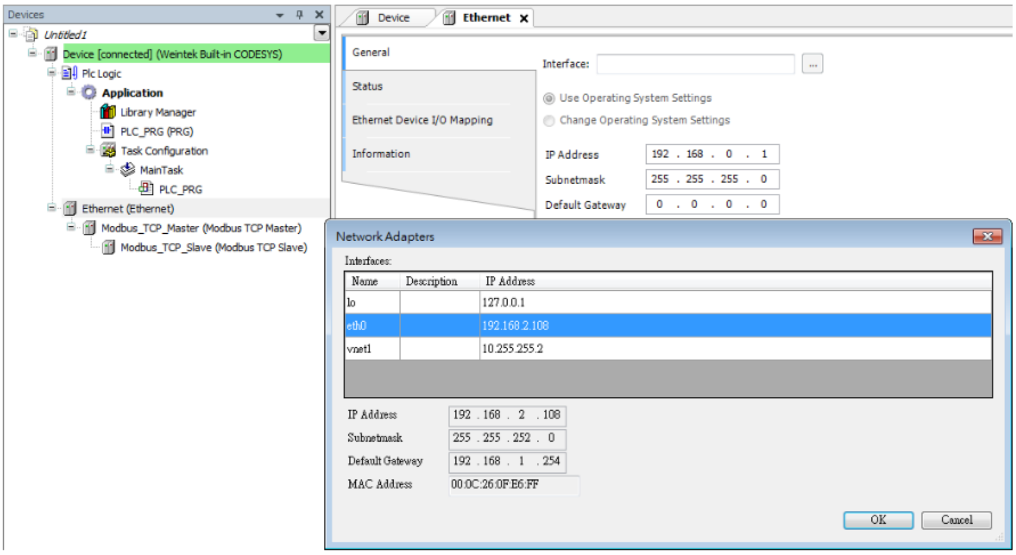
Add Device
Name: Modbus_TCP_Master
Action: ● Append device ○ Insert device ○ Plug device ○ Update device

Name	Vendor	Version	Description
Modbus TCP Master	3S - Smart Software Solutions GmbH	3.5.10.0	A device that wo

Add Device
Name: Modbus_TCP_Slave
Action: ● Append device ○ Insert device ○ Plug device ○ Update device

Name	Vendor	Version	Description
Modbus TCP Slave	3S - Smart Software Solutions GmbH	3.5.10.0	A generic Modbus c

1. Ethernet adapter-
Double-click [Ethernet]. On the [General] tab, click on […] button nearby [Interface]. Then select “eth0”
[Use Operation System Settings]: Sets Ethernet adapter to DHCP mode.
[Change Operation System Settings]: Sets Ethernet adapter to Static IP. In this mode, you must enter IP address and subnet mask.



Interface:
● Use Operating System Settings
○ Change Operating System Settings
IP Address 192 . 168 . 0 . 1
Subnetmask 255 . 255 . 255 . 0
Default Gateway 0 . 0 . 0 . 0

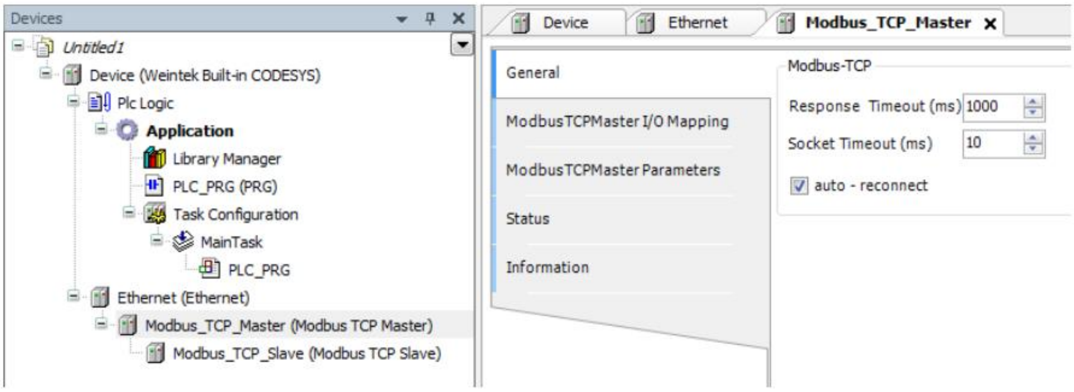
Network Adapters
Interfaces:

Name	Description	IP Address
lo		127.0.0.1
eth0		192.168.2.108
vnet1		10.255.255.2

IP Address 192 . 168 . 2 . 108
Subnetmask 255 . 255 . 252 . 0
Default Gateway 192 . 168 . 1 . 254
MAC Address 00:0C:26:0F:E6:FF

2. Modbus TCP Master-

On the [General] tab, check [auto-reconnect]. The Modbus TCP Master will re-establish the connection if a communication error happens.



Modbus-TCP

Response Timeout (ms) 1000

Socket Timeout (ms) 10

☑ auto - reconnect

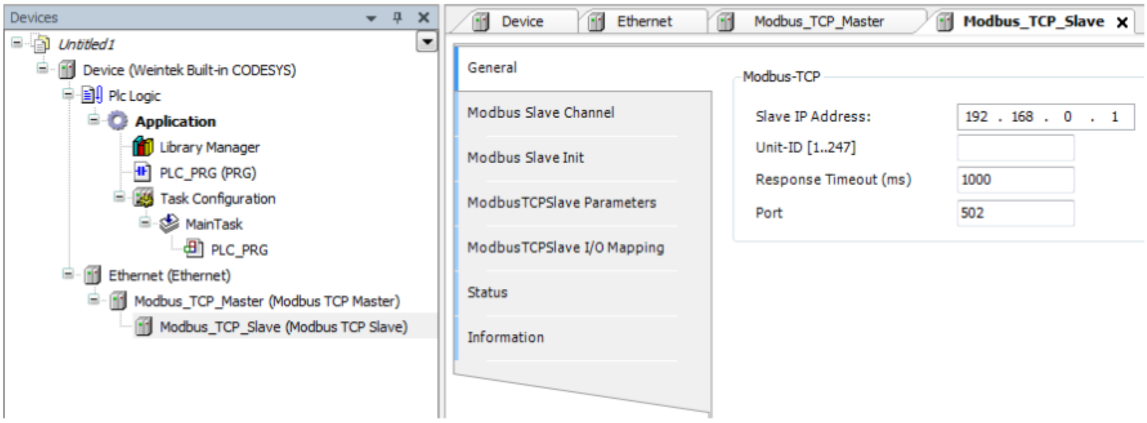
3. Modbus TCP Slave-

On the [General] tab,

[Slave IP Address]- Enter IP address of the iR-ETN.

[Unit-ID]- Modbus Node ID of the iR-ETN is 1.

[Port]- is TCP port used for communication. Modbus TCP port is configured to 502 by default.



Modbus-TCP

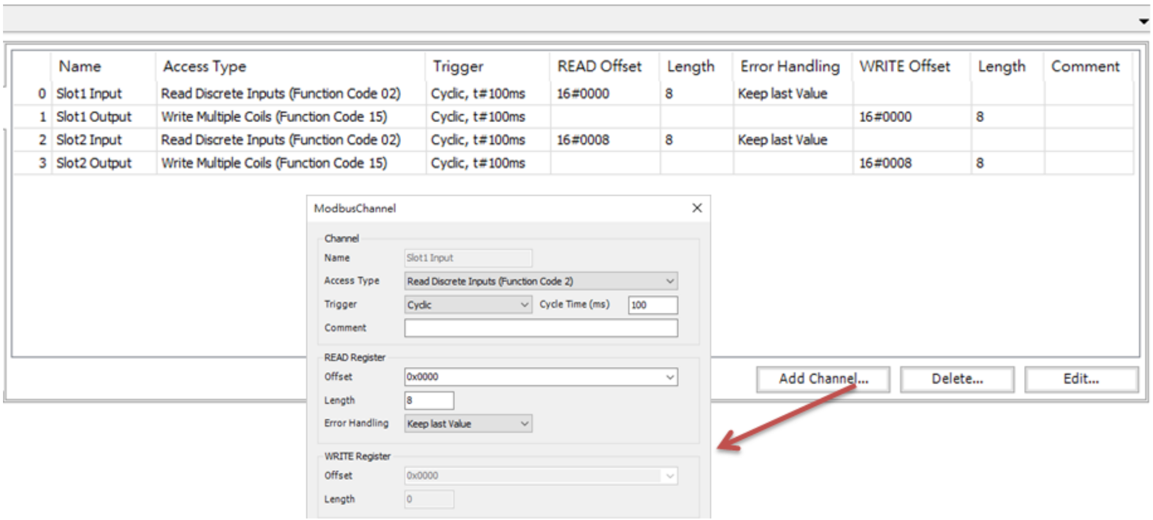
Slave IP Address: 192 . 168 . 0 . 1

Unit-ID [1..247]

Response Timeout (ms) 1000

Port 502

On the [Modbus Slave Channel] tab, configure Modbus channels. Each channel contains a Modbus command that will be sent to the Modbus slaves. Click [Add Channel] button to add channels.



	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	Slot1 Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	8	Keep last Value			
1	Slot1 Output	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0000	8	
2	Slot2 Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0008	8	Keep last Value			
3	Slot2 Output	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0008	8	

ModbusChannel

Channel

Name: Slot1 Input

Access Type: Read Discrete Inputs (Function Code 2)

Trigger: Cyclic Cycle Time (ms) 100

Comment:

READ Register

Offset: 0x0000

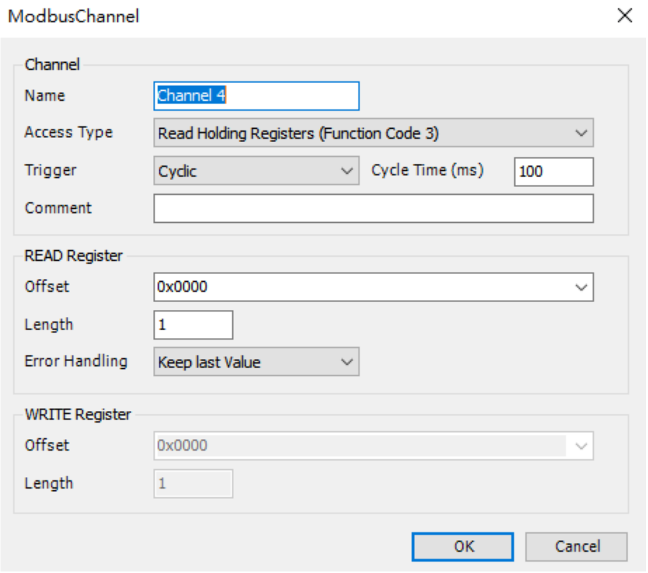
Length: 8

Error Handling: Keep last Value

WRITE Register

Offset: 0x0000

Length: 0



ModbusChannel

Channel

Name: Channel 4

Access Type: Read Holding Registers (Function Code 3)

Trigger: Cyclic Cycle Time (ms): 100

Comment:

READ Register

Offset: 0x0000

Length: 1

Error Handling: Keep last Value

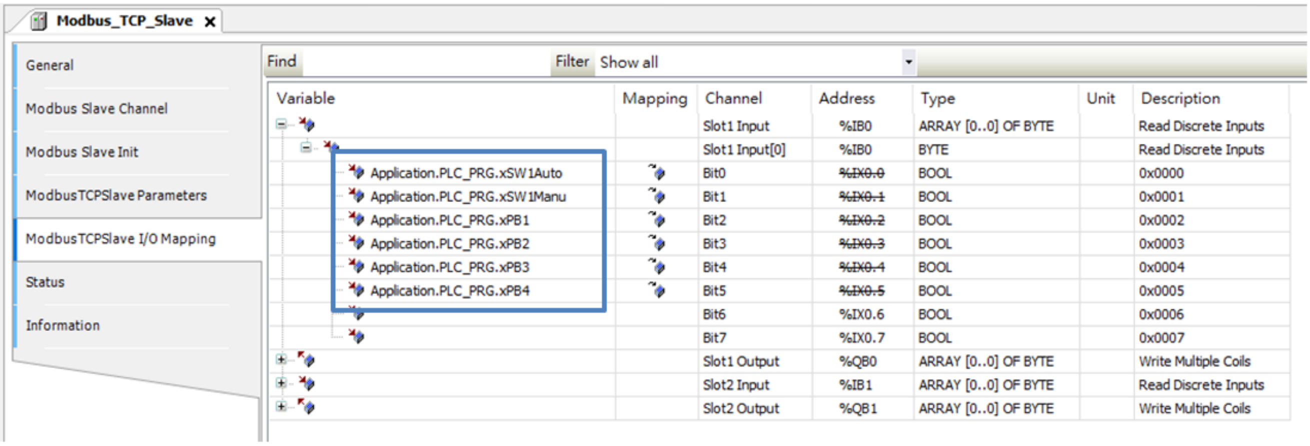
WRITE Register

Offset: 0x0000

Length: 1

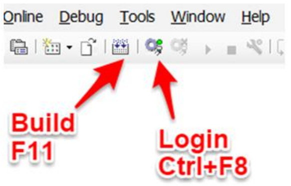
[Name] - Channel name
[Access type]- Selection of the Modbus function code
[Trigger]- It determines if the command should be cyclic (time-based) or rising edge (trigger-based)
If cyclic is chosen, the cycle time must be set up for this channel. If rising edge is chosen, the command is executed on the rising edge event of a boolean variable which is defined in [Modbus TCP slave I/O mapping] tab.
[Comment]- You can enter a comment if needed.
[Offset]- The Modbus starting address. (hexadecimal format)
[Length]- The number of the bits or registers
Read Register and **Write Register** are available based on the function code you choose.

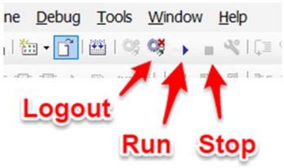
On [Modbus TCP Slave IO Mapping] tab, you can map variables defined in this project to the IOs.

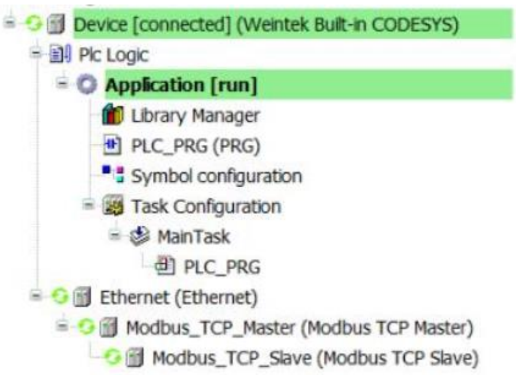


Variable	Mapping	Channel	Address	Type	Unit	Description
		Slot1 Input	%IB0	ARRAY [0..0] OF BYTE		Read Discrete Inputs
		Slot1 Input[0]	%IB0	BYTE		Read Discrete Inputs
Application.PLC_PRG.xSW1Auto		Bit0	~~%IX0.0~~	BOOL		0x0000
Application.PLC_PRG.xSW1Manu		Bit1	~~%IX0.1~~	BOOL		0x0001
Application.PLC_PRG.xPB1		Bit2	~~%IX0.2~~	BOOL		0x0002
Application.PLC_PRG.xPB2		Bit3	~~%IX0.3~~	BOOL		0x0003
Application.PLC_PRG.xPB3		Bit4	~~%IX0.4~~	BOOL		0x0004
Application.PLC_PRG.xPB4		Bit5	~~%IX0.5~~	BOOL		0x0005
		Bit6	%IX0.6	BOOL		0x0006
		Bit7	%IX0.7	BOOL		0x0007
		Slot1 Output	%QB0	ARRAY [0..0] OF BYTE		Write Multiple Coils
		Slot2 Input	%IB1	ARRAY [0..0] OF BYTE		Read Discrete Inputs
		Slot2 Output	%QB1	ARRAY [0..0] OF BYTE		Write Multiple Coils

Transfer the project to the device by clicking [Build] and then [Login] on the toolbar. To run the program, click on [Run]. The green circle marks on the device window indicate the devices are connected successfully.







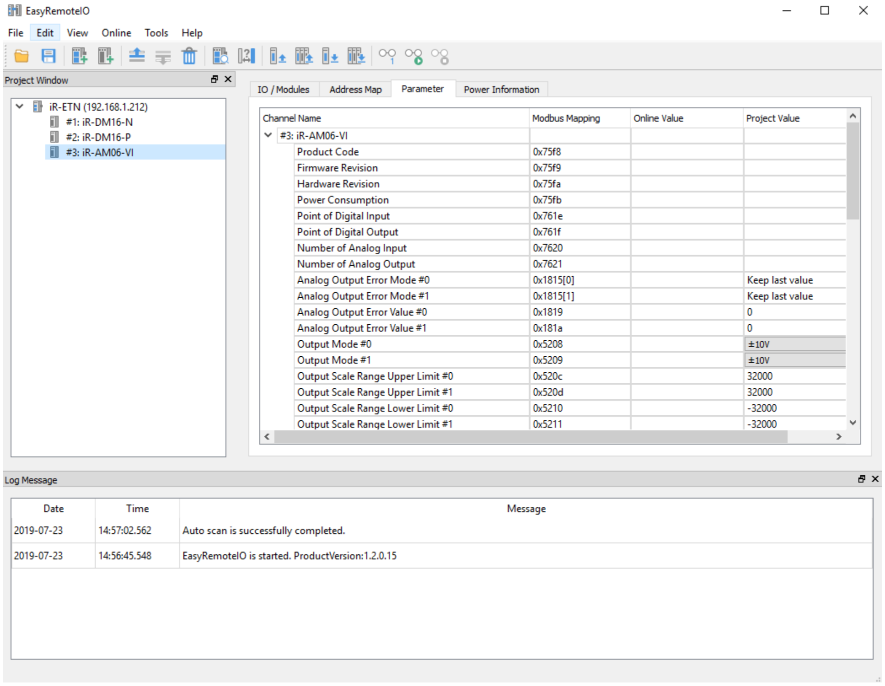
Device [connected] (Weintek Built-in CODESYS)
Plc Logic
Application [run]
Library Manager
PLC_PRG (PRG)
Symbol configuration
Task Configuration
MainTask
PLC_PRG
Ethernet (Ethernet)
Modbus_TCP_Master (Modbus TCP Master)
Modbus_TCP_Slave (Modbus TCP Slave)

Appendix C- PLCopen XML

The PLCopen XML standardizes the way to exchange configuration files between development environments. The **export PLCopenXML** is a tool to simplify IO configuration in Codesys development platform for iR-ETN and is available in **EasyRemoteIO version 1.2.0.15 or greater version.**

How to Export PLCopen XML

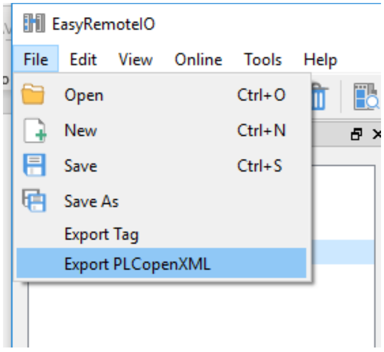
Launch **EasyRemoteIO** application and configure the IO modules.



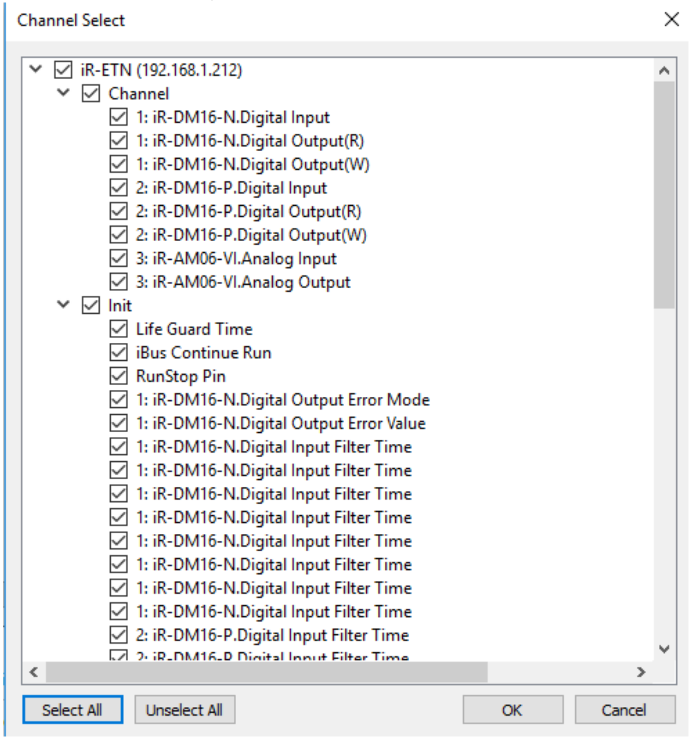
Channel Name	Modbus Mapping	Online Value	Project Value
#3: iR-AM06-VI			
Product Code	0x75f8		
Firmware Revision	0x75f9		
Hardware Revision	0x75fa		
Power Consumption	0x75fb		
Point of Digital Input	0x761e		
Point of Digital Output	0x761f		
Number of Analog Input	0x7620		
Number of Analog Output	0x7621		
Analog Output Error Mode #0	0x1815[0]		Keep last value
Analog Output Error Mode #1	0x1815[1]		Keep last value
Analog Output Error Value #0	0x1819		0
Analog Output Error Value #1	0x181a		0
Output Mode #0	0x5208		±10V
Output Mode #1	0x5209		±10V
Output Scale Range Upper Limit #0	0x520c		32000
Output Scale Range Upper Limit #1	0x520d		32000
Output Scale Range Lower Limit #0	0x5210		-32000
Output Scale Range Lower Limit #1	0x5211		-32000

Date	Time	Message
2019-07-23	14:57:02.562	Auto scan is successfully completed.
2019-07-23	14:56:45.548	EasyRemoteIO is started. ProductVersion:1.2.0.15

Go to [File] tab and click [Export PLCopenXML]



The XML file includes all information about you IO modules. Click [OK] and save the XML file.

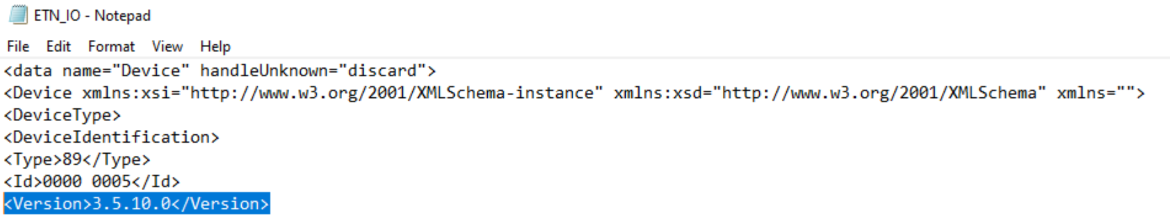


- ☑ iR-ETN (192.168.1.212)
  - ☑ Channel
    - ☑ 1: iR-DM16-N.Digital Input
    - ☑ 1: iR-DM16-N.Digital Output(R)
    - ☑ 1: iR-DM16-N.Digital Output(W)
    - ☑ 2: iR-DM16-P.Digital Input
    - ☑ 2: iR-DM16-P.Digital Output(R)
    - ☑ 2: iR-DM16-P.Digital Output(W)
    - ☑ 3: iR-AM06-VI.Analog Input
    - ☑ 3: iR-AM06-VI.Analog Output
  - ☑ Init
    - ☑ Life Guard Time
    - ☑ iBus Continue Run
    - ☑ RunStop Pin
    - ☑ 1: iR-DM16-N.Digital Output Error Mode
    - ☑ 1: iR-DM16-N.Digital Output Error Value
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 1: iR-DM16-N.Digital Input Filter Time
    - ☑ 2: iR-DM16-P.Digital Input Filter Time
    - ☑ 2: iR-DM16-P.Digital Input Filter Time

Note: The XML file can be imported into Codesys development platform v3.5.10. If your codesys version is greater than v3.5.10, please do the following steps.

1. Open the XML file on **Windows Notepad**.

2. Search for "**<Version>3.5.10.0</Version>**". The version number must match your current Codesys version. For example, if your Codesys version is v3.5.12, please change it to "<Version>3.5.12.0</Version>".



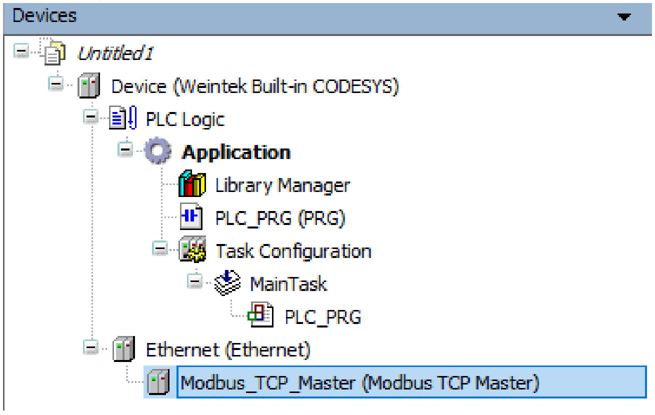
```
<data name="Device" handleUnknown="discard">
<Device xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="">
<DeviceType>
<DeviceIdentification>
<Type>89</Type>
<Id>0000 0005</Id>
<Version>3.5.10.0</Version>
```

3. Save this XML file.

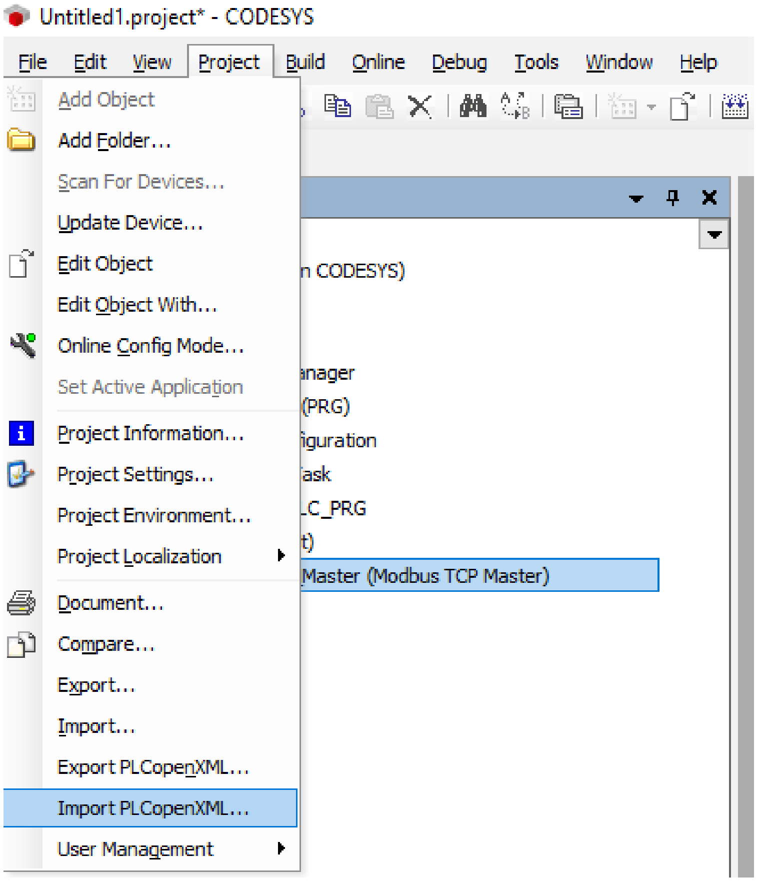
How to Import PLCopen XML in Codesys

Launch Codesys and create a new project for **Weintek Built-in Codesys**.

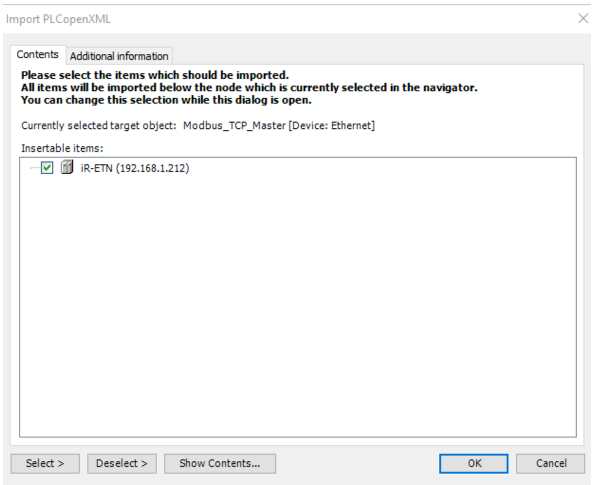
Right-click [Device] on the Device window and select [Add Device]. Then select [Ethernet Adapter] » [Ethernet]. Click [Add Device] button to add an Ethernet adapter.
Under the Ethernet adapter, create a Modbus_TCP_Master device. ([Fieldbusses] » [Modbus] » [Modbus TCP Master] » [Modbus TCP Master])



Click [Modbus TCP Master] and go to [Project] tab and click [Import PLCopenXML…]



This dialog prompts you to insert the iR-ETN device under [Modbus TCP Master]. Click [OK] to confirm.



Import PLCopenXML

Contents | Additional information

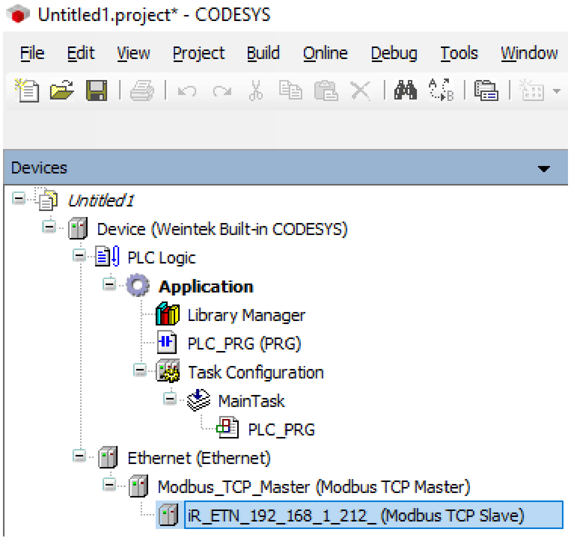
Please select the items which should be imported.
All items will be imported below the node which is currently selected in the navigator.
You can change this selection while this dialog is open.

Currently selected target object: Modbus_TCP_Master [Device: Ethernet]

Insertable items:

☑ iR-ETN (192.168.1.212)

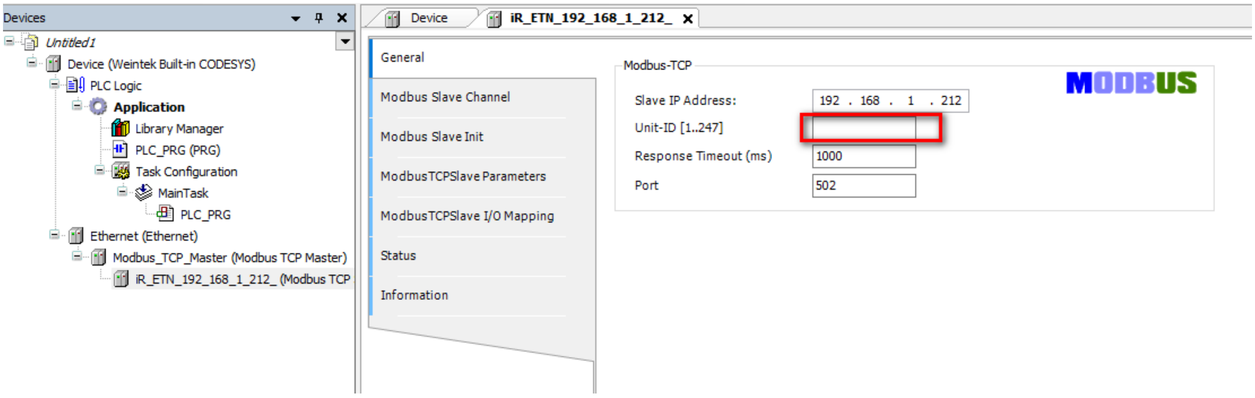
The iR-ETN configuration is populated in the device tree.



Untitled1.project* - CODESYS

```
Untitled1
  Device (Weintek Built-in CODESYS)
    PLC Logic
      Application
        Library Manager
        PLC_PRG (PRG)
        Task Configuration
          MainTask
            PLC_PRG
    Ethernet (Ethernet)
      Modbus_TCP_Master (Modbus TCP Master)
        iR_ETN_192_168_1_212_ (Modbus TCP Slave)
```

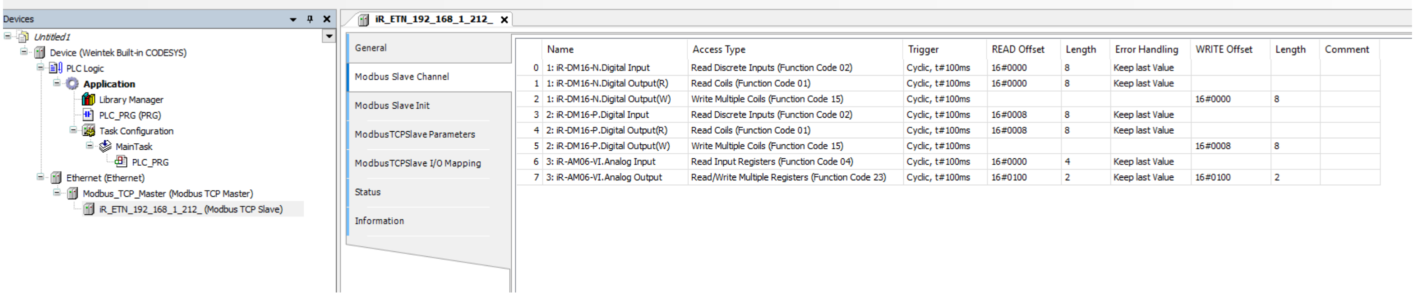
Double click [Modbus TCP Slave] and enter the **Unit-ID** on [General] tab.



Modbus-TCP

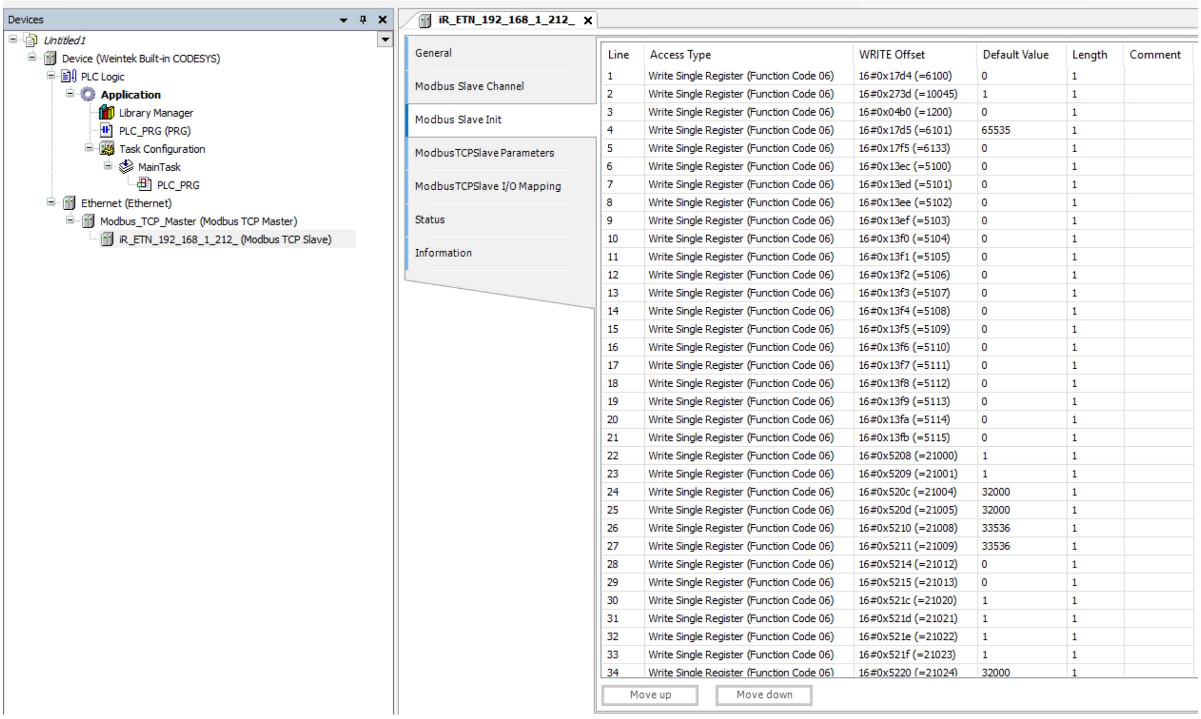
Slave IP Address:	192 . 168 . 1 . 212
Unit-ID [1..247]	
Response Timeout (ms)	1000
Port	502

Genereal



	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length	Comment
0	1: iR-DM16-N.Digital Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0000	8	Keep last Value			
1	1: iR-DM16-N.Digital Output(R)	Read Coils (Function Code 01)	Cyclic, t#100ms	16#0000	8	Keep last Value			
2	1: iR-DM16-N.Digital Output(W)	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0000	8	
3	2: iR-DM16-P.Digital Input	Read Discrete Inputs (Function Code 02)	Cyclic, t#100ms	16#0008	8	Keep last Value			
4	2: iR-DM16-P.Digital Output(R)	Read Coils (Function Code 01)	Cyclic, t#100ms	16#0008	8	Keep last Value			
5	2: iR-DM16-P.Digital Output(W)	Write Multiple Coils (Function Code 15)	Cyclic, t#100ms				16#0008	8	
6	3: iR-AM06-VI.Analog Input	Read Input Registers (Function Code 04)	Cyclic, t#100ms	16#0000	4	Keep last Value			
7	3: iR-AM06-VI.Analog Output	Read/Write Multiple Registers (Function Code 23)	Cyclic, t#100ms	16#0100	2	Keep last Value	16#0100	2	

Modbus Slave Channel



Line	Access Type	WRITE Offset	Default Value	Length	Comment
1	Write Single Register (Function Code 06)	16#0x17d4 (=6100)	0	1	
2	Write Single Register (Function Code 06)	16#0x273d (=10045)	1	1	
3	Write Single Register (Function Code 06)	16#0x04b0 (=1200)	0	1	
4	Write Single Register (Function Code 06)	16#0x17d5 (=6101)	65535	1	
5	Write Single Register (Function Code 06)	16#0x17f5 (=6133)	0	1	
6	Write Single Register (Function Code 06)	16#0x13ec (=5100)	0	1	
7	Write Single Register (Function Code 06)	16#0x13ed (=5101)	0	1	
8	Write Single Register (Function Code 06)	16#0x13ee (=5102)	0	1	
9	Write Single Register (Function Code 06)	16#0x13ef (=5103)	0	1	
10	Write Single Register (Function Code 06)	16#0x13f0 (=5104)	0	1	
11	Write Single Register (Function Code 06)	16#0x13f1 (=5105)	0	1	
12	Write Single Register (Function Code 06)	16#0x13f2 (=5106)	0	1	
13	Write Single Register (Function Code 06)	16#0x13f3 (=5107)	0	1	
14	Write Single Register (Function Code 06)	16#0x13f4 (=5108)	0	1	
15	Write Single Register (Function Code 06)	16#0x13f5 (=5109)	0	1	
16	Write Single Register (Function Code 06)	16#0x13f6 (=5110)	0	1	
17	Write Single Register (Function Code 06)	16#0x13f7 (=5111)	0	1	
18	Write Single Register (Function Code 06)	16#0x13f8 (=5112)	0	1	
19	Write Single Register (Function Code 06)	16#0x13f9 (=5113)	0	1	
20	Write Single Register (Function Code 06)	16#0x13fa (=5114)	0	1	
21	Write Single Register (Function Code 06)	16#0x13fb (=5115)	0	1	
22	Write Single Register (Function Code 06)	16#0x5208 (=21000)	1	1	
23	Write Single Register (Function Code 06)	16#0x5209 (=21001)	1	1	
24	Write Single Register (Function Code 06)	16#0x520c (=21004)	32000	1	
25	Write Single Register (Function Code 06)	16#0x520d (=21005)	32000	1	
26	Write Single Register (Function Code 06)	16#0x5210 (=21008)	33536	1	
27	Write Single Register (Function Code 06)	16#0x5211 (=21009)	33536	1	
28	Write Single Register (Function Code 06)	16#0x5214 (=21012)	0	1	
29	Write Single Register (Function Code 06)	16#0x5215 (=21013)	0	1	
30	Write Single Register (Function Code 06)	16#0x521c (=21020)	1	1	
31	Write Single Register (Function Code 06)	16#0x521d (=21021)	1	1	
32	Write Single Register (Function Code 06)	16#0x521e (=21022)	1	1	
33	Write Single Register (Function Code 06)	16#0x521f (=21023)	1	1	
34	Write Single Register (Function Code 06)	16#0x5220 (=21024)	32000	1	

Modbus Slave Init(Initial)

Reference Link:
Weintek Labs website: http://www.weintek.com

This document is subject to change without prior notice.

Founded in 1996, WEINTEK LABS is a global-leading HMI manufacturer and is dedicated to the development, design, and manufacturing of practical HMI solutions. WEINTEK LAB's mission is to provide quality, customizable HMI-solutions that meet the needs of all industrial automation requirements while maintaining customer satisfaction by providing "on-demand" customer service. WEINTEK LABS brought their innovative technology to the United States in 2016, WEINTEK USA, INC., to provide quality and expedient solutions to the North American industrial market.

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